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Industrial Production in the United Kingdom, 1900-1953

By T. M. Ridley

The current official index of industrial production is based on the year 1948, but the series starts at 1946. For various reasons it would be convenient to have the series projected backwards to a much earlier date, and the purpose of this article is to describe an attempt made to establish a continuous series of annual indices (omitting the war years) going back to the beginning of the century.

The method used was first to select various indices of production covering parts of the period and then to adjust them where necessary and link them together. Census of production results provided the benchmarks against which the selection and adjustments were made. As much of the work had already been done by previous writers[1] little remained to be done beyond collecting their contributions to the subject and bringing them up to date. The procedure can be conveniently described in four stages.

1953 to 1935

In order to work backwards through the period, the current official index of industrial production was taken as the starting point.[2] This index relates to the United Kingdom and covers mining and quarrying, manufacturing, building and contracting and gas, electricity and water production. The weights are based on net outputs in 1948. The index required no adjustment for this calculation in which 1948 was also taken as the base year.

The official Interim Index of Industrial Production for the United Kingdom provided the link between the years 1935 to 1938 and 1946.[3] The Interim Index employs two methods of weighting, one based on the net outputs of industries in 1935 as shown by the census of production for that year, and the other on a special estimate of the net outputs of industries in 1946. The geometric mean of the results obtained with the two sets of weights was used to establish the relationship between each of the years 1935 to 1938 on the one hand and the year 1946 on the other.

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[1] *The Measurement of Production Movements*, by C. F. Carter, W. B. Reddaway and Richard Stone. University of Cambridge Department of Applied Economics. Cambridge University Press, 1948. In particular see Part III and Bibliography.

[2] *The Index of Industrial Production*. Studies in Official Statistics, No. 2. H.M.S.O. 1952.

[3] *The Interim Index of Industrial Production*. Studies in Official Statistics No. 1. H.M.S.O. 1949. See Part II. Also *Monthly Digest of Statistics*, August 1948.

One special feature of the Interim Index must be mentioned. For the years 1936, 1937 and 1938 the sections of the index for mining and quarrying, building and contracting and gas, electricity and water production were calculated in the usual way, that is, by applying each of the two sets of weights in turn to basic production indicators, but in the case of manufacturing industries the two calculated indices for 1935 were projected into 1936, 1937 and 1938 by using the manufacturing component of the Board of Trade index of production as the indicator. The accuracy of the Interim Index for these years therefore depends partly on the accuracy of the Board of Trade index.

Attention has been drawn to the fact that in 1938 the Board of Trade index, in common with contemporary indices of production, fell sharply from the peak reached in 1937, contrasting with a quite moderate fall in the volume of employment.[1] The figures for manufacturing industries are shown in Table 1. As 1938 is frequently used as a year of reference in making comparisons between present and pre-war days, it is clearly important to know whether the fall in the index for that year gives a genuine or an exaggerated reflection of the movement of industrial production.

TABLE 1

BOARD OF TRADE INDEX OF PRODUCTION IN MANUFACTURING INDUSTRIES COMPARED WITH EMPLOYMENT*

1937=100

		1936	1937	1938
Building materials, etc.	production	93	100	100
	employment	93	100	99
Iron and steel	production	90	100	79
	employment	88	100	88
Non-ferrous metals	production	87	100	88
	employment	85	100	97
Engineering and shipbuilding	production	90	100	95
	employment	89	100	102
Textiles	production	98	100	86
	employment	98	100	89
Leather, and boots and shoes	production	102	100	94
	employment	98	100	96
Food, drink and tobacco	production	96	100	101
	employment	96	100	101
Chemicals, oils, etc.	production	93	100	95
	employment	93	100	105
Miscellaneous	production	93	100	96
	employment	96	100	99
All manufacturing industries	production	93	100	92
	employment	93	100	97

* Number of insured workers at mid-year less average numbers unemployed during year.

Apart from the fact that the fall in output seems to be out of proportion to the fall in the level of employment in 1938, the more positive suggestion has been made that the index shows a downward bias owing to the omission of a series for finished munitions at a time when their production was being rapidly expanded.[1] This suggestion can be considered in the light of the figures given in Table 1.

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[1] " Indices of Industrial Output ", by R. and W. Stone, *Economic Journal*, 1939, p. 477; and " Studies in the National Income, 1924–38 ", edited by A. L. Bowley (N.I.E.S.R.), pp. 151–53.

Primarily, munitions production is associated with the engineering and shipbuilding industry group, and a comparison of the indices of production and employment in this group shows a discrepancy in 1938 which might conceivably be explained by the omission from the production index of the expanding munitions output. Assuming no change in labour productivity—a rather generous assumption at a time when industry is changing the direction of its activities—the discrepancy would account for a 2 per cent. fall in the index for all manufacturing industries. The discrepant movements in production and employment in the chemical trades between 1937 and 1938 are even larger than in engineering and shipbuilding. It is unlikely that failure to take account of expanding activity in the relatively small explosives trade could account for the whole of this, but even if it did do so, the consequent deficiency in the total manufacturing index would only be about one half of 1 per cent. Thus the omission of finished munitions from the index might make a difference of as much as 2½ per cent. in the level of manufacturing, the equivalent of just under 2 per cent. in the wider field of industrial production as a whole.

However, there is reason to suppose that the difference would be less than this. Between 1937 and 1938 defence expenditure including expenditure under the Defence Loans Act, 1937, amounted to approximately £110 million—about 5 per cent. of the total net output of industry. Part of this increased expenditure was absorbed by pay and allowances of the armed forces and by increased expenditure on works and miscellaneous items outside the field of manufacturing industry. Part went to pay for the building and equipping of Royal Ordnance Factories and the building of shadow factories. After making estimated allowances for these and other items outside the field of munitions stores, it seems unlikely that the inclusion or exclusion of finished munitions including ships and aircraft (at net output weights) could make a difference of much more than 1 per cent. in the level of industrial production in 1938. Having regard to the fact that there are some items of defence expenditure such as clothing outside the field of finished munitions which are not adequately represented in the Board of Trade index, it was decided to make an addition of 1½ per cent. to industrial production (equal to an addition of 2 per cent. to manufacturing industries) to cover increased defence expenditure on both munitions and non-munitions stores.

A larger addition did not seem justified. On the economic front 1938 was a bad year. United Kingdom exports fell by 10 per cent. in value and rather more in volume. The " ton-mile " and " freight traffic originating " figures of the railways also fell by 10 per cent. Viewed against this background it is not unreasonable to associate the fall in manufacturing output, now reduced to 6 per cent., with a 3 per cent. drop in the employment figures. Short-time working and other aspects of under-employment likely to be experienced at such a time would cause falling production to be accompanied by falling output per man-year. This was the experience in 1952 when, in comparison with 1951, manufacturing production fell by 4 per cent. while manufacturing employment fell by 1 per cent.

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[1] " Indices of Industrial Output ", by R. and W. Stone, *Economic Journal*, 1939, p. 477; and " Studies in the National Income, 1924–38 ", edited by A. L. Bowley (N.I.E.S.R.), pp. 151–53.

The link obtained between 1935 and 1948 can be compared with a calculation made by Mr. B. C. Brown of the Board of Trade[1] using census of production material. Unfortunately, the 1948 census related only to Great Britain hence the calculation is limited to the same area. The calculation also excludes the whole of the building and contracting industry. This " census " index is shown in Table 2 alongside comparable portions of the production index which have been obtained by taking the Interim Index for 1935 to 1946 and projecting it to 1948 by using the current official index of production.

TABLE 2

INDICES FOR 1948 (1935=100)

	1935 weights		post-war weights		geometric mean	
	Production index	" Census " index	Production index	" Census " index	Production index	" Census " index
Mining and quarrying	89·4	88·8	89·2	87·1	89·2	87·9
Manufacturing ..	134·3	140·7	127·5	131·3	130·9	135·9
Building and contracting ..	89·8	..	89·8	..	89·8	..
Gas, Electricity and water ..	193·8	192·8	179·0	174·1	186·2	183·2
Total ..	130·6	..	121·1	..	125·8	..

Since the two sets of figures in Table 2 are not strictly comparable, perfect agreement between them cannot be expected. The " census " index gives the higher results for manufacturing industries and the lower results for mining and quarrying and for gas, electricity and water. The immediate problem, however, is to determine the degree of difference between the indices for the whole industrial field.

In order to compare the total production index with the calculation based on the censuses, the production index for building and contracting was combined with the census indices for the other industry groups, using index of production weights:

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[1] London and Cambridge Economic Service, *Bulletin*, in *Times Review of Industry*, December 1954, p. vii.

1935 weights	..	135·0
1948 weights	..	120·9 (Paasche formula)
geometric mean	..	127·8

Taking the geometric mean results, the difference between the adjusted " census " index for 1948 (127·8) and the production index (125·8) is only 1½ per cent. This is smaller than might be expected considering that manufacturing industries, which carry about three-quarters of the total weighting, show a difference of nearly 4 per cent. The smallness of the difference between the total indices is partly due to the offsetting differences in mining and quarrying and in gas, electricity and water, but mainly the explanation lies in the fact that the total production indices have been obtained by linking the total indices of the Interim Index and the current official index and not by taking a weighted average of the separate industry group figures shown in Table 2.

In view of the closeness of these results and having regard to the omission of Northern Ireland from the census indices, the relationship between 1935 and 1948 as established by the production indices was accepted. The ratio between the two years of 100: 125·8 can be expressed as 79·5: 100 and it is given in this latter form in Table 4 below.

1935 TO 1924

For this period the annual index of the London and Cambridge Economic Service[1] was selected. The series goes back to 1920 and thus provides a useful overlap with the earlier period 1907–24. The index relates to the United Kingdom and is weighted according to net outputs in 1924. It includes agriculture and excludes gas, electricity and water. It also excludes building for the years 1920 to 1922. For the purpose of this article the agricultural element was excluded and gas, water and electricity and (for the years 1920–22) building were added. The adjustments were made as follows:

(*a*) Estimates of water supplies are available for the census of production years 1924, 1930 and 1935. The figures in index form are 100, 108 and 116 respectively and appear to indicate continuous growth. As the weight given to water in the index is small, the hypothesis of continuous growth was accepted and indices of water supplied were interpolated for the years 1925 to 1929 and 1931 to 1934 accordingly.

(*b*) The component for building in the London and Cambridge Economic Service index is based entirely on the completion of new houses in Great Britain and it is given a weight corresponding to this activity only. The building of new houses and employment in the building and contracting industry as a whole both expanded substantially between 1924 and 1935, but in the case of house building the expansion was so much greater that to have used new houses as an indicator for the whole industry would have implied unlikely gains in man-year productivity. As no information seems to be available about the amount of work done each year in other sections of the industry—other new building, repair work and contracting—it was decided to accept the London and Cambridge Economic Service index as it stood. This was equivalent to assuming that, over the period, work other than new housing moved in sympathy with the index of production as a whole. In theory, the assumption could have been tested by reference to the censuses of production for 1924, 1930 and 1935, but for this section of the building industry numerous practical difficulties would have to be resolved before a satisfactory test could be made.

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[1] London and Cambridge Economic Service, *Monthly Bulletin*, May 23rd, 1939.

(*c*) Something remained to be done about building for the years before 1923, and a housing series based on new Schedule A tax assessments was introduced for the years 1920 to 1922. The figures which related to financial years were adjusted to fit calendar years. An allowance was also made for the growing volume of work in progress which must have been an important factor in these early post-war years when the industry was re-establishing itself.

(*d*) Series for the annual production of gas and electricity in Great Britain are readily available and were incorporated in the index.

(*e*) The London and Cambridge Economic Service index, as adjusted, was grafted on to the Interim Index by overlapping the years 1935 to 1937.

This particular index number was selected to reflect the course of production through the whole of this period in the light of evidence provided by Professor Devons.[1] On the basis of this evidence it has been shown by R. and W. Stone[2] and by C. F. Carter, W. B. Reddaway and Richard Stone[3] that the index, which employs 1924 weights, is in marked agreement with an index employing 1930 weights and based on the censuses of production for the years 1924, 1930 and 1935. Unfortunately, there is no census of production index employing 1935 weights against which the London and Cambridge Economic Service index could be tested.

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[1] "Production Trends in the United Kingdom", by E. Devons, *Manchester School*, Vol. 10, 1939, pp. 55–61.

[2] "Indices of Industrial Output", by R. and W. Stone, *Economic Journal*, 1939, p. 477, and "Studies in the National Income, 1924–38", edited by A. L. Bowley (N.I.E.S.R.), pp. 151–53.

[3] *The Measurement of Production Movements* by C. F. Carter, W. B. Reddaway and Richard Stone. University of Cambridge Department of Applied Economics. Cambridge University Press, 1948. In particular see Part III and Bibliography.

1924 TO 1907

An earlier index of the London and Cambridge Economic Service[1] based on 1907 weights and covering the mining and quarrying and manufacturing industries over the years 1907 to 1913 and 1920 to 1923 was used for this period. Adjustments were made to bring the coverage into line with that of the indices dealt with above. For 1920 to 1923, housing and public utility figures were incorporated in the same way as was done in adjusting the later London and Cambridge Economic Service Index based on 1924. For the pre-war years public utility figures were taken from the censuses of production for 1907 and 1912, and supplementary information for intermediate years, though fragmentary, did not suggest that the assumption of continuous growth over the period 1907 to 1913 would be unreasonable.

For building and contracting, the censuses of production show the same labour force in 1907 as in 1924. Output of bricks and cement in 1907, however, is 89 per cent. of the 1924 level in each case, while according to taxation returns, new housing seems to be about 80 per cent. Taking into account the facts that output per man in this industry may have increased between 1907 and 1924 and that new housing is only part of the industry's output (there must have been a considerable amount of work done on public utility buildings, particularly electric power stations, in the pre-war period), it was decided to use the figure of 89 per cent. to establish the level for 1907 and to vary it for the years 1908 to 1913 according to unemployment records for the building trades (joiners and carpenters). The resulting series for building and contracting was given its full weight and incorporated in the index for the years 1907 to 1913. As a matter of interest its inclusion had little effect on the movements of the index during these years.

By equating the years 1920 to 1923 in the later and the earlier London and Cambridge Economic Service indices, the adjusted series for 1907 to 1913 and 1920 to 1923 can be projected to 1924 and it becomes possible to compare the relationship between 1907 and 1924 as established by the index numbers with that established by calculations based on the censuses of production.

The annual index numbers of the London and Cambridge Economic Service relating 1907 to 1924 depended on industries and imported materials which were exceptionally depressed in the post-war years and furthermore, they could make no allowance for the tendency of British industry to do an increasing amount of fabrication to a given quantity of raw material. After reconsidering the matter, J. W. F. Rowe, who had compiled the indices, suggested[2] that for the post-war years they might be as much as 5 per cent. too low; 1924 thus becomes 6 per cent. instead of 1 per cent. above 1907. (See Table 3, columns 1 and 2.)

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[1] " The Physical Volume of Production ", by J. W. F. Rowe. *London and Cambridge Economic Service Special Memorandum*, No. 8, 1924.

[2] London and Cambridge Economic Service, *Monthly Bulletin*, No. 6, 1927.

N. A. Tolles and Paul H. Douglas,[1] using census of production results, estimated the increase in production over the period to be 30·9 per cent. using 1907 weights and 16·5 per cent. using 1924 weights. The geometric mean of the indices 130·9 and 116·5 is 123·5. It is interesting to note the similarity of experience over the two World Wars. As estimated above, adjusted census data show 1948 to be 35·0 per cent. above 1935 on 1935 weights and 20·9 per cent. above on 1948 weights. In both cases the pre-war weighting gives the higher post-war result. In the case of the period including the first World War, there is a gap of about 12 per cent. between the results obtained with the two sets of weights over an interval of 17 years while in the period including the second World War, the gap is about the same over a 13-year interval.

For the years intervening between 1907 and 1924, Tolles and Douglas suggest " with some hesitation the results which are obtained by combining our results for the end year 1924 with the assumption that Rowe's index is the best measure for the year to year fluctuations in production ".[2] They accordingly increase Rowe's index (in its original form) for the years 1920 to 1924 by 5 per cent. (Rowe's own suggestion, quoted above) and, starting with 1908, add progressively for each year one-seventeenth of the remaining difference between their index for 1924 and Rowe's. The underlying assumption was that the annual index " got into error gradually and continuously throughout the period of seventeen years—due, say, to factors which he was progressively less able to measure ".

Since Rowe's figures have already been adjusted to include building and public utilities and to exclude agriculture, it is assumed that this adjusted series will give a better measure of year-to-year fluctuations than the original index. In consequence the amendment proposed by Tolles and Douglas has been superimposed on this series. The differences arising through this treatment between the series resulting and the one obtained by Tolles and Douglas can be explained in terms of particular movements in the activities of the building and public utility industries. The comparison is shown in Table 3, columns 3 to 5.

It is impossible to feel completely satisfied with this method of obtaining indices for the years between 1907 and 1924. The progressive error in Rowe's index may not have crept in so smoothly and regularly. This point can be given further consideration by dividing the period into two parts, the post-war years and the pre-war years, and examining each in the light of the evidence available.

For the post-war years use can be made of the overlap between the two London and Cambridge Economic Service series after all the adjustments mentioned above have been incorporated:

1948=100	1920	1921	1922	1923	1924
earlier index ..	58·8	44·4	54·4	56·0	60·8
later index ..	62·2	43·6	52·8	54·4	60·8

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[1] " A Measurement of British Industrial Production ", by N. A. Tolles and Paul H. Douglas, *Journal of Political Economy*, Vol. 38, 1930.

[2] *Ibid.*, pp. 13–14.

TABLE 3

INDEX OF PRODUCTION 1907–1924

	Rowe's Annual Index (*a*)	Add 5% 1920–24	Final adjustment (*b*)	Tolles and Douglas' series	Cause of differences between columns (3) and (4)
	(1)	(2)	(3)	(4)	(5)
1907	100·0	100·0	100·0	100	
1908	91·3	91·3	92·3	92	
1909	95·0	95·0	97·0	97	
1910	95·9	95·9	98·9	99	
1911	102·1	102·1	106·1	107	
1912	104·6	104·6	109·6	110	
1913	109·9	109·9	115·9	118	Building and gas production show less than average improvement.
1920	101·0	106·0	119·0	120	
1921	72·3	75·9	89·9	84	Very rapid improvement in housing.
1922	89·5	95·0	110·0	107	
1923	92·6	97·2	113·2	115	Decline in housing.
1924	101·0	106·0	123·0	123	

a 1907=100. Adjusted to include building and gas, electricity and water and to exclude agriculture.

b. One-seventeenth of 123 minus 106=1 point per annum added cumulatively.

The difference between the two indices for 1920 is rather large. Having regard to the method by which the earlier index was obtained and to the fact that the later index seems to give acceptable results for the years 1924 to 1935, it was decided to use the later index for 1920 to 1924 and to discard the earlier index. Figures for 1918 and 1919 were then obtained by using an index constructed by W. Hoffmann[1] covering mining, manufacturing, gas and electricity and adjusted to include housing. Hoffmann's index was linked with the London and Cambridge Economic Service later index by equating the years 1920 to 1922.

For the pre-war years a comparison can be made between the earlier index of the London and Cambridge Economic Service (as adjusted), and Hoffmann's series (adjusted to include building):

	1908	1909	1910	1911	1912	1913
1907=100—						
earlier index ..	92·3	97·0	98·9	106·1	109·6	115·9
Hoffman's index ..	94·4	95·8	99·3	102·6	104·2	114·2
national income ..	96·7	98·0	100·4	103·0	105·9	108·4

Since the material available for calculating index numbers before the first World War was limited, it is more than likely that rival index numbers will tend to show a similar bias and therefore a series giving national income at constant prices[2] which has been calculated from the income side is quoted to provide some independent evidence. Assuming that industrial production is slightly more variable than national income, both indices seem consistent with the national income figures. The increase in Hoffmann's figures between 1912 and 1913, however, looks rather large and it was decided to accept the adjusted earlier index of the London and Cambridge Economic Service.

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[1] See *Weltwirtschaftliches Archiv.*, September 1934, p. 398.

[2] " National Income of the United Kingdom, 1870–1946 ", by A. R. Prest, *Economic Journal*, 1948, pp. 58–59.

Nineteen thirteen, like 1938, is a year which is liable to be used as a year of reference, and it would be extremely useful to know whether the figure of 115·9 (1907=100) can be relied upon. While it seems to agree fairly well with Hoffmann's figure, the acceptance of this agreement would imply that Hoffmann's figure for 1912 (and perhaps 1911 also) is too low. On the other hand if Hoffmann's figure for 1913 is too high, then the earlier index for that year must be too high also. After a final appeal to the corresponding national income indices, the figure of 115·9 seems reasonably acceptable. If it is in error the chances are that the true figure would be somewhat lower.

A final note is necessary to conclude the discussion of the 1924 to 1907 period. Politically, Southern Ireland was included in the United Kingdom in 1907 and excluded in 1924. In making their comparison between the two years, Tolles and Douglas eliminate most of the discontinuity which would be caused by the change in the geographical scope of the index of production by using Great Britain figures for those commodities having any significant volume of production in Southern Ireland in 1907. Effectively, therefore, Southern Ireland is excluded throughout. Production in Southern Ireland in the early 1920s was about 2½ per cent. of the volume of production in the United Kingdom excluding Southern Ireland; this gives some idea of the magnitude of what has been excluded from the index of production for the United Kingdom in those years when Southern Ireland was properly a part.

1907 TO 1900

The information for this period is so fragmentary that no satisfactory method of projection was possible. Hoffmann's index is available, and there is also an index of industrial activity constructed by Lord Beveridge[1] which includes shipping clearances and railway traffic. After comparing these indices with each other and with the series for national income referred to above,[2] a notional series was written down to represent the course of industrial production during the period.

	1900	1901	1902	1903	1904	1905	1906
1907=100							
Hoffmann	89·0	87·5	89·1	89·0	88·4	94·4	98·2
industrial activity [3]	85	86	86	85	85	91	97
National income	90·0	89·5	90·2	87·9	88·4	92·3	97·3
notional series	88	87	88	87	87	93	98

[1] *Full Employment in a Free Society*, by Lord Beveridge, 1944, pp. 310–14.

[2] "National Income of the United Kingdom, 1870–1946", by A. R. Prest, *Economic Journal*, 1948, pp. 58–59.

[3] As the trend has been removed from the indices of industrial activity quoted by Lord Beveridge, the figures given for 1900 to 1907 are the result of an attempted reconstruction of the original series.

CONCLUSION

The final chain of index numbers is shown in Table 4. It may be useful to summarise the weighting systems employed in its major links. 1907 and 1924 are connected by the well known Fisher " ideal " formula which combines the results obtained by using the weights of both these years. In the next period, 1924, 1930 and 1935 are linked by using 1924 weights only, but it is interesting to find that Professor Devons' calculations with 1930 weights show parallel results for these years. 1935 and 1946 are linked by another Fisher " ideal " formula and from 1946 onwards 1948 weights are employed.

The system by which the current official index of production has been projected backwards to 1900 would have seemed more consistent had it been possible, in every case, to link the index for a census of production year with that for the census year immediately preceding it, using the " ideal " formula throughout. Whether it would have been more satisfactory to employ this or any other alternative technique is a theoretical question well beyond the limited objective of this article.[1] The use of alternative techniques would generally have led to alternative results, and this fact serves to emphasise the limited range of uses to which the series in Table 4 can be put.

London.

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[1] The inadequacy of index numbers for making long-run comparisons is discussed by R. G. D. Allen in " The Economic Theory of Index Numbers ", *Economica*, August 1949, pp. 197–203.

TABLE 4

INDUSTRIAL PRODUCTION IN THE UNITED KINGDOM, 1900 TO 1953

	Notional series	L. & C. earlier index (*a*)	Hoffmann (adjusted)	L. & C. later index (*a*)	Interim index (*b*)	Current official index	Final series
Weights	. .	1907 and 1924	. .	1924	1935 and 1946	1948	—
Base year	1907=100	1907=100	1913=100	1924=100	1946=100	1948=100	1948=100
1900	88						43
1901	87						43
1902	88						43
1903	87						43
1904	87						43
1905	93						46
1906	98						48
1907	100	100·0					49·4
1908		92·3					45·6
1909		97·0					47·9
1910		98·9					48·9
1911		106·1					52·4
1912		109·6					54·2
1913		115·9					57·3
1918			77·1				53·7
1919			87·3				60·8
1920			89·1	102·4			62·2
1921			61·9	71·8			43·6
1922			76·7	86·9			52·8
1923				89·5			54·4
1924		123·0		100·0			60·8
1925				100·6			61·2
1926				88·9			54·0
1927				112·1			68·1
1928				109·2			66·4
1929				117·3			71·3
1930				108·4			65·9
1931				99·1			60·2
1932				99·7			60·6
1933				108·7			66·1
1934				123·1			74·8
1935				132·1	91·4		79·5
1936				143·6	100·2		87·2
1937				151·7	107·0		93·1
1938					102·2		88·9
1946					100·0	87·0	87·0
1947						92·4	92·4
1948						100·0	100·0
1949						106·4	106·4
1950						113·6	113·6
1951						117·3	117·3
1952						113·9	113·9
1953						120·6	120·6

(*a*) London and Cambridge Economic Service indices, as adjusted.
(*b*) Index for 1938 increased by 1½ per cent.

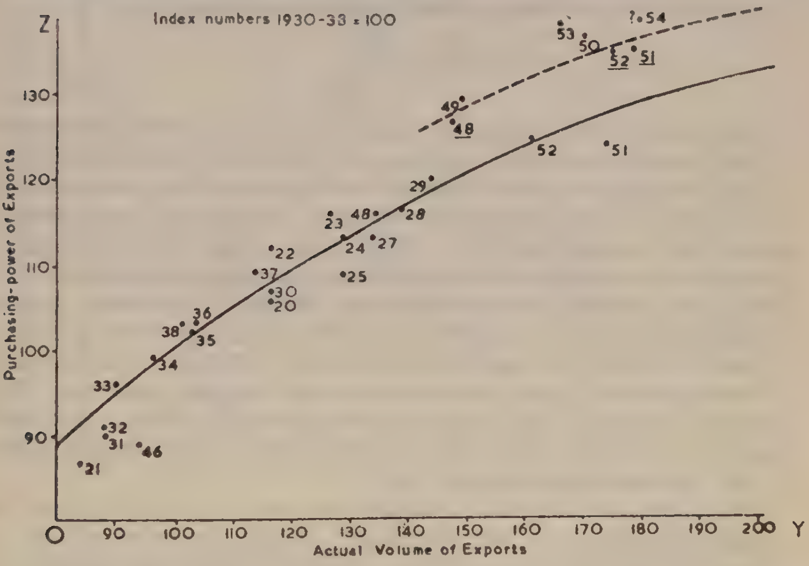
The Purchasing Power of British Exports[1]

By R. L. Marris

The Chart represents a kind of historical "foreign transformation curve"[2] for the United Kingdom. For every year since 1920, except the war years and two other years of gross disturbance from the supply side (1926 and 1947), the volume of merchandise exports has been plotted against the volume of imports over which they gave

CHART I

THE VOLUME OF BRITISH EXPORTS AND THEIR IMPORT PURCHASING POWER
1920 – 1954



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[1] This article owes its genesis to Mr. K. E. Berrill of St. Catharine's College, Cambridge. It was he who, in 1947, when we were both working in the Central Economic Planning Staff, noticed the closeness of the pre-war relationship between the volume of exports and the terms of trade: Mr. Berrill cannot, however, be blamed for any errors I may have made in attempting to carry the analysis into the post-war period and the future, nor for any errors in the statistical method. Mr. P. R. Fisk, Statistical Assistant to the Faculty of Economics in this University, gave statistical assistance which was both efficient and constructive, and Miss Jane Ayres gave essential assistance in the preparation of the Charts.

[2] See H. J. Johnson, "The Optimum Tariff", *Review of Economic Studies*, Vol. XIX (1) No. 48. Whether or not the historical curve depicted in Chart I can in any way be taken as an approximation to the static curve of pure theory is discussed below.

command.[1] In symbols[2] the horizontal axis of Chart I, OY, and the vertical axis, OZ, are defined by

$$Z = \frac{Y}{X} \qquad \text{(index numbers, 1930–38 = 100)}$$

where

X = U.K. terms of trade (import prices/export prices);
Y = volume of U.K. merchandise exports;
Z = purchasing power of exports.

The numbers beside the plotting points indicate the years: those with underlined numbers (post-war only) are actuals adjusted for certain disturbances, according to principles described on page 16 below. All others are actuals, according to the usual Board of Trade data.

The curves shown in the Chart are not the product of a non-linear correlation between Y and Z. They represent the regression of Y upon X transformed into the required hyperbola. That is to say, the hypothesis was $Y = \beta X - \alpha$; α and β were statistically estimated in the usual way and the estimated values substituted into

$$Z\left(=\frac{Y}{X}\right) = \frac{\beta}{1 + \frac{\alpha}{Y}}$$

for the purpose of defining the curves.[3] A linear relationship between X and Y seems the statistical hypothesis with which to work; everything is kept in terms of volume and no variable enters into both sides of any equation. The relationship comprises, in principle, both income-effects and substitution-effects: in the case of the United Kingdom, an adverse movement of the terms of trade evidently implies significantly larger real incomes for her customers; similarly it probably implies some improvement in competitiveness. But a common cause of a shift in the U.K.'s terms of trade is a world-wide shift in the relative prices of manufactured goods *vis-à-vis* those of primary products. The difficulty, therefore, in interpreting the historical data is the well-known association, which has persisted since 1918, between shifts of this type and the trade cycle.

That there is a historical association between X and Y, and that the relationship is linear, is beyond doubt, as may be seen from Chart II.

Over the whole of the inter-war period, the linear correlation coefficient, r, works out at over ·95. What is more, if the period is broken into two separate parts, each of which might have been expected to possess very different underlying characteristics, 1920–29 (excluding

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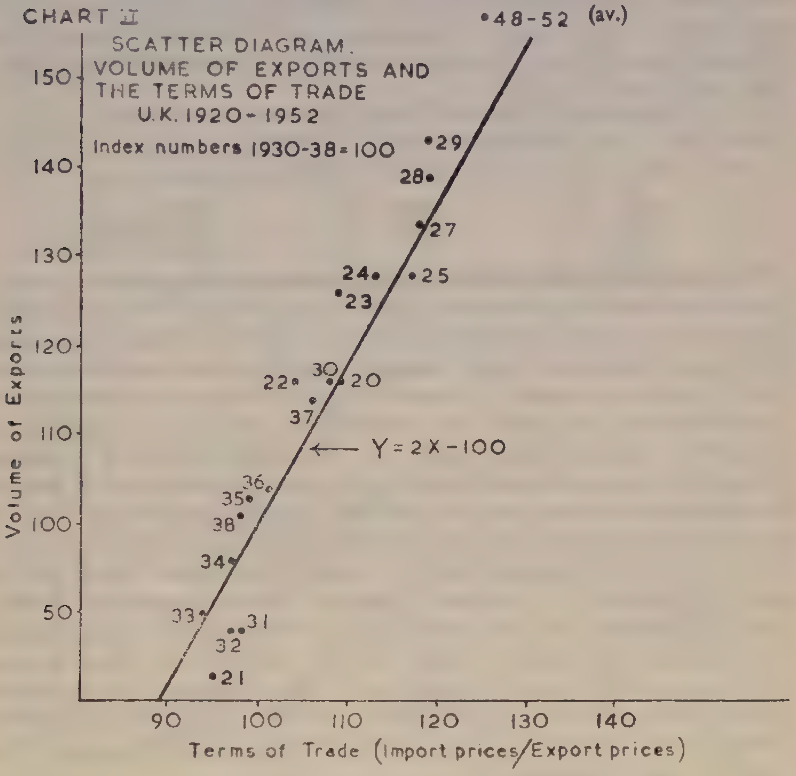
[1] I.e. not actual imports, but the volume of imports which would have been obtained had the current value of imports always exactly equalled the current value of exports; (with the data in index-number form it is sufficient to say, " if the real value of the balance of trade had remained constant ").

[2] Except where otherwise stated, all symbols which follow, other than Greek letters for parameters, represent index numbers with the average of the years 1930–38 taken as 100. Where one index number divides another to produce a third, the remultiplication by 100 is taken as read.

[3] Thus, in effect, converting the terms of trade into the dependent variable; see n. 1, p. 22 below.

1926) and 1930–38, not only do the correlation coefficients remain high, about ·95 and ·90 respectively, but the estimates of the parameters hardly change: the equation estimated from 1920–29 data would have done a good job of prediction throughout the 1930's. Whether or not, since the war, the parameters have changed is a question to be discussed.

CHART II



As a matter of fact, the separate estimates of β work out at 2·14 and 2·15 for 1920–29 and 1930–38 respectively, i.e. they do not differ substantially from the round number 2. If β is pegged at 2, the α of best fit for all three periods is little different from 100. So a good rule of thumb, which has the merit of not appearing to suggest bogus accuracy, is:—

$$Y = 2\ X - 100.$$

This, of course, gives slightly lower values for r but the worst, 1930–38, remains as high as ·84. Full details of the various estimates of parameters and the corresponding correlation coefficients are given in Appendix A. Before the war, provided one had an assumption about either X or Y, the predictive value of $Y = 2\ X - 100$ for the other variable would have been considerable: in 17 years there was no case of an error greater than 4 per cent. and only two of errors over 3 per cent. (taking X as given and forecasting Y). Since the war, taking the period 1948 to 1952 as a whole, the actual terms of trade index (X) stood at an average of 125; " predicted " exports (Y) were therefore 150. Actually, they averaged 157, an error of 4½ per cent., which seems not unreasonable. But owing to the substantially greater variance of Y in the post-war period, the percentage errors for individual post-war years have been rather higher (and would, of course, have been so even had the correlation coefficient not been a little lower also). The errors were as follows :—

PERCENTAGE EXCESS OF ACTUAL EXPORT VOLUME OVER PREDICTED EXPORT VOLUME

($Y_c = 2X - 100$)

	%		%		%
1946	−15	1949	+14	1952	+ ½
1947	−22	1950	+13	1953	+19
1948	+ 1½	1951	− 3	1954	+15[1]

The historical development of these errors seems suggestive. Supply restrictions were by no means entirely eliminated by the end of 1947. Some exports, quite a substantial amount, must have been pulled back by internal inflation in 1948; that is to say that more could have been sold at the prices asked. There was therefore an excess demand for British exports: and since the relationship in question is essentially an equilibrium demand relationship, an adjustment should in principle be made for excess demand when testing it. Y, actual exports, should be adjusted to Y'—an estimate of what exports would have been at the ruling export prices if supply had been unlimited at those prices—before comparison is made with Y_c, which is the symbol which will be used henceforth for predicted exports. Similar arguments would apply to the years 1951 and 1952. There are also, more rarely, reasons for adjusting the terms of trade, and the case for all these adjustments is argued in detail in Appendix B: the discussion is relegated to an Appendix not for concealment but merely to avoid breaking the thread of the argument at this point. Briefly, the conclusions of the Appendix are as follows:—

1948 (inflation), Y' exceeds Y by 10 per cent.
1949 No adjustment.
1950 No adjustment.
1951 (Steel shortage in the second part of the year) Y' exceeds Y by 3 per cent., also X exceeds X' by 5 per cent.
1952 Y' exceeds Y by 8 to 10 per cent., for a number of reasons.

A summary of notation may now be convenient:—

X . . . actual terms of trade, 1930–38 = 100.
X'. . . adjusted terms of trade.
Y . . . actual export volume.
Y' . . . ditto adjusted.

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[1] This and all other figures relating to 1954 below are estimates based on information available to the author at the end of November 1954.

Y_c . . . export volume predicted by an estimating equation.
α and β constant and marginal parameters respectively in a linear estimating equation in Y' and X'.

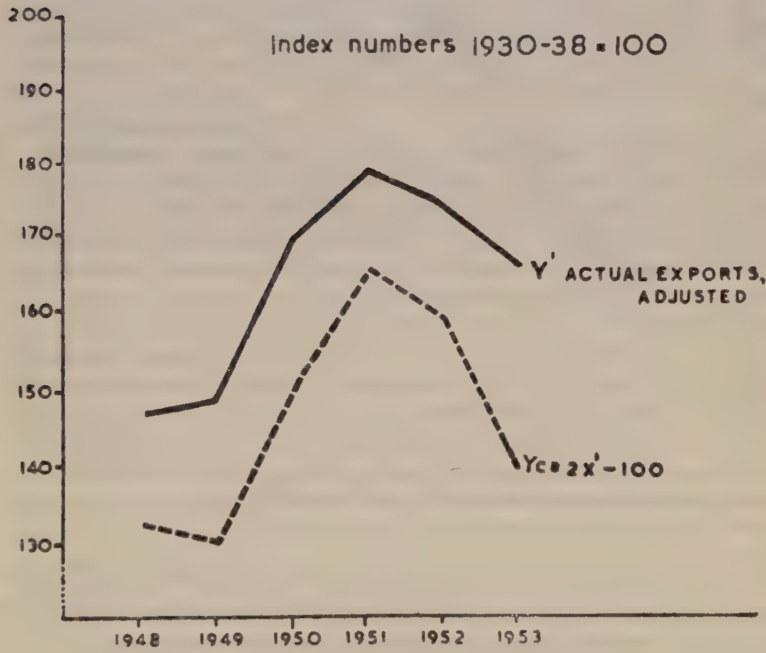
The following is a tabular summary of the implications of the adjustments made for the period 1948–1952:—

	1948	1949	1950	1951	1952	1953
Actual terms of trade (X)	116	115	125	140	130	120
Actual exports (Y)	134	148	170	174	161	166
Actual terms of trade, adjusted (X')	116	115	125	133	130	120
Actual exports, adjusted (Y') ..	147	148	170	179	175	166
$2X' - 100$	132	130	150	166	160	140

When these are charted (Charts IIIa and IIIb) there leaps out instantly a strong suggestion that, since before the war, α has fallen. There is also some suggestion of a fall in β but on so short a run of figures this must remain no more than an idea. Both changes would be plausible. The fall in α would be explicable by both the permanent factor of the rise in world population and production and by temporary factors such as the absence of full German and Japanese competition, and discrimination against dollar imports in the non-dollar world.

CHART III A

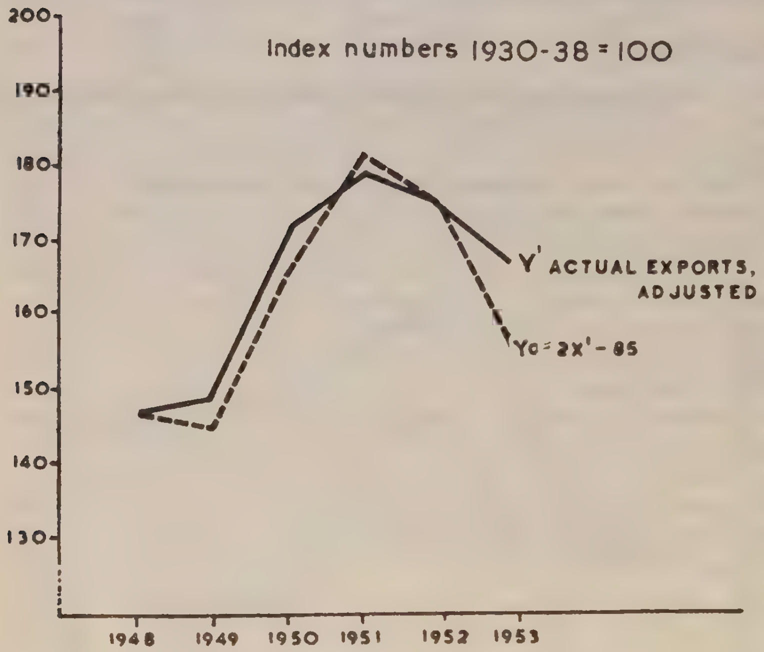
ADJUSTED VOLUME OF EXPORTS 1948–53



The former of these temporary factors should surely have hardly influenced the data as late as 1952, yet in that year and in subsequent years the apparent low level of α persisted and indeed (see below) seemed to increase. The influence of the second temporary factor is more difficult to assess: according to reports available at the time of writing, convertibility and a general relaxation of sterling area restrictions on dollar imports are not expected to lead to any catastrophic reduction in U.K. exports, although some modest adverse effect must surely eventuate. On the whole, therefore, the major part of the shift which, on the basis of 1948–52 appears to be of the order of 15 points, seems best attributed to the permanent factor, i.e. the rise in world production. The transformed version of $Y_c = 2X' - 85$ is therefore shown as a dotted line in Chart I. As stated, the underlined plotting points represent Y' plotted against $\frac{Y'}{X'}$. It may be thought that the suggested adjustments, both to data and parameters, savour strongly of cooking the experiment. Certainly they do. Certainly

CHART III B

ADJUSTED VOLUME OF EXPORTS 1948-53



such adjustments must be highly subjective. Certainly there is great scope for the introduction of bias, conscious or unconscious, so that the final result must tend to confirm some hypothesis to which one is already wedded. Chart III does not "prove" the validity of $Y_c = 2\ X' - 85$; nor, for that matter, does Chart I prove the pre-war validity of $Y = 2\ X - 100$: one can perfectly well argue, in the manner of the cigarette manufacturers, that the whole thing might have been a fluke.[1] But what has been shown is that the pre-war data are, to say the least of it, extremely suggestive, and it has also been shown that with the post-war data an almost equally suggestive result can be obtained after a set of adjustments which are theoretically essential and whose direction and order of magnitude are reasonable. And that, in my opinion, given what we know of the Nature and Significance of applied economic science, is saying quite a lot.[2]

The question of a possible shift in β is closely bound up with the question of the relationship between the historical curve and the "true", or static, foreign transformation curve of theory. The remainder of the present article is concerned first with this question; second with the question, "in what sense, and to what extent, can one say that the terms of trade have been unduly favourable to this country during the past two years?" Third, it is concerned with the economic policy conclusions, if any, which can be drawn from the story.

A foreign transformation curve shows[3] how, other things being equal, a country's purchasable volume of imports varies with the volume of exports: as exports are increased, they must be sold cheaper according to the foreign elasticity of demand. If the foreign elasticity of demand is greater than unity so that more can be spent on imports, the prices of imports may tend to rise, according to the foreign elasticity of supply. Other things being equal, therefore, the elasticity of purchasable imports with respect to exports (volume) will, with "normal" foreign demand and supply elasticities, tend to be positive but less than unity. With such a curve a government may, if it knows the national marginal rate of substitution between home produced goods and import-type goods, determine an optimum level of trade.[4] If import-type goods can also be produced at home, the optimum can be computed, perhaps less ambiguously, if the government knows the transformation curve between production of these goods at home and that of home produced goods in general. The other things which must be equal, therefore, are as follows:—

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[1] I have not attempted to compute standard errors.

[2] Notice that the procedure did *not* consist of merely trying to explain away the years in which the fit of the original equation happened to be bad. Each year was adjusted on its merits, even though the result was to reduce generally the fit of the original equation, some of the best-fitting years taking the largest adjustments. Surely that is the proper (and reasonable) way to proceed when (i) theoretical considerations lead one to expect that the original equation ought *not* to fit, and (ii) one would like to obtain some idea of a modified equation for post-war use.

[3] See Johnson, *loc. cit.*

[4] With the usual Welfare qualifications.

(*a*) the balance of trade (in real terms);
(*b*) the level of production in the outside world;
(*c*) tariffs and quantitative restrictions in the outside world.

In the historical data, none of these conditions is satisfied. Non-fulfilment of condition (*a*), however, does not, on examination, appear to have been capable of serious quantitative importance and will be ignored. The absence of (*b*) would not matter much if all we were faced with was a reasonably steady long-term upward trend: that problem can be dealt with by the insertion of a suitable expression for trend in the estimating equation, and the adjustment to the parameter α which we have suggested above is based on this idea. (A single discontinuous adjustment from pre-war to post-war was chosen because, as it happens, there is no evidence of trend in the pre-war data, as may be seen in Diagram I.[1]) The trouble is not the trend, but the cycle. Cyclical fluctuations in production in the outside world are strongly correlated with variations in the U.K. terms of trade. Such a correlation is bound to introduce a bogus element into the slope of the historical curve relatively to the " true " static curve. It is important, however, not to exaggerate the degree of this bogosity. The relationship implied in the textbook foreign transformation curve must itself comprise both an income-effect and a substitution-effect. Now it is generally agreed that during a slump or recession, the real income of different countries in the outside world falls in different ways according to whether they are major manufacturing nations or primary specialists. Thus income falls:—

(1) in manufacturing countries, from the fall in internal employment;
(2) in primary producing countries, from the direct effect of the adverse movement in the terms of trade (i.e. from the effect of the correlation we are discussing);
(3) in primary producing countries, additionally from any fall in production which may result from the deflationary influences of (1) and (2) injected via the balance of payments.

Only (1) and (3) are irrelevant. (2) is an entirely valid effect, the income-effect in the textbook curve. Since it is generally accepted that in primary producing countries a slump takes the form of a fall in prices rather than a fall in production, and since the United Kingdom does a very large share of her trade with such countries, the quantitative importance of the bogosity may therefore be less than might have been thought. To the extent, however, that bogus elements were present before the war, and to the extent that cyclical movements have been less since the war, one would in fact expect to find some fall in the parameter β.

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[1] A possible explanation would be that the effects of the secular rise in world production were offset by a rising tendency in tariffs. Although the latter certainly existed in the 'thirties, there is no clear trend (i.e. no tendency in Chart I for Z/Z_c to be higher in later years and vice versa) in the 'twenties either. There is, however, a suggestion of an upward trend (in Z/Z_c) of about 1 per cent. per annum over the period 1925 to 1929, which is quite interesting.

From the preceding arguments the general conclusion would be that the historical curve does provide some sort of approximation towards the static curve, but with upward bias in the elasticity. However, severer critics could well attack this qualified conclusion in the following manner. They could say that the strong association between exports and the terms of trade displayed in the historical data is almost entirely attributable to the various kinds of income-effect. But the true transformation curve must contain an additional element to the income-effect, it must also contain substitution-effect. No element of this substitution-effect is contained in the historical data for the United Kingdom because the substitution-effect which is relevant is the effect on the volume of U.K. sales in primary and other markets, if the level of U.K. manufacturing prices is substantially reduced while those of other manufacturing exporters remain constant. Of such an event, history (since 1918) has little experience. What the historical curve largely shows, it might be argued, is the effect (entirely an income-effect) on U.K. exports of changes in *all* manufacturing prices, including those of her competitors, relatively to all primary prices. (One cannot deny the force of this criticism, although the period does contain the devaluation of 1949, which might be regarded as an example of potential substitution-effect : 1949 and 1950 both lie very close to $Y_e = 2X' - 85$ and if we say that part of the increment of exports between the two years was due to some " bogus " element of the type of both (1) and (3) above, we again arrive at the idea of a lower " genuine " value for the slope parameter.)

Thus one may take two views of my curves. One view, as already indicated, would accept them as qualified estimates of the static foreign transformation curve of the textbooks. The other would say that they mainly represent a picture of what normally happens to the purchasing power of U.K. exports during the course of a recession associated with a world-wide shift in the terms of trade between primaries and manufactures. I think it is reasonable to claim that the curves, if still valid for the future, have value on both views. On the first view they are useful for policy decisions directly, on the second for forecasting, and therefore for policy indirectly.

But *are* they still valid for the future ? Most readers will already have noticed how the relationship seems to have gone awry both for 1953 and 1954 (although less so for 1954 than 1953). In these last two years the conjunction between the volume of exports and the terms of trade was unusually favourable to this country, a fact which shows up on Diagram I as an upward deviation of the plotting points from the curve. This proposition can be put more precisely. So long as there is any empirical association, however caused, between exports and the terms of trade (and this seems proved) it is entirely wrong to speak of movements of the terms of trade, as Ministers and ex-Ministers have sometimes done, as if of an Act of God, entirely independent of other factors in a balance of payments situation. If we want a concept of the "terms of trade" which represents only the exogenous element of national luck in the game of international trade, we must use an appropriate definition. Such a definition depends on acceptance of a definite view as to the form of the relationship between the two variables, and the numerical values of the parameters. One can then define the terms of trade by reference to the extent to which, in the year in question, the country has succeeded in escaping from the iron law of the estimating equation. More precisely, such an index would represent the ratio of the actual purchasing power of exports to the predicted purchasing power, i.e. the purchasing power which the basic estimating equation would have predicted to have been obtained from the actual volume of exports. This ratio is the ratio of the height of the vertical ordinate of a plotting point in Chart I to the distance cut off on that ordinate by the curve. It is identical with the reciprocal of the ratio of the actual terms of trade, as previously defined, to the predicted terms of trade[1] and it can be computed so long as one has Y' for both years (the volume of exports) and agreed estimates of α and β. I think this is more informative than the usual definition. Certainly it seems rather silly, in Economic Surveys and the like, to speak of as "favourable" or "unfavourable" movements of the "terms of trade" (on the usual definition) which are largely the concomitant of opposite movements in the volume of exports.

On the above definition it is certainly true that the government have experienced favourable terms of trade of late. The following is the computation of my suggested index, for the period 1948—1952, using $\alpha = 85$ and β still $= 2$. Note that a favourable movement now appears as a rise in the index.

	"TERMS OF TRADE" (my definition) X_c/X'	"TERMS OF TRADE" (usual definition) $1/X'$, 1948 = 100
1948	99½	100
1949	101	101
1950	102	93
1951	99	84
1952	100	90
1953	104	97
1954	103	94

When the series is set out one notices that my index is less erratic than the ordinary price-ratio index (as one would hope and expect): i.e. a good deal of the variation in the ordinary index is statistically explained by movements in exports (or vice-versa). One can also observe definite evidence of an upward trend of, say, ¾ per cent. per annum.[1] Would that be reasonable in relation to the known upward trend of world production ? On the whole probably, yes.[2] Therefore, although this government has indeed been fortunate, compared with its predecessor, the good fortune has largely consisted in coming later in time; if I am right about the trend, there is nothing " abnormal " about 1954. Indeed if I were forced to take a bet on the future, in the sense of being forced to predict the volume of exports which will be necessary to obtain command over various alternative given levels of imports some years hence, I would work with

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[1] Transform $Y_c = \beta X' - \alpha$ into $X_c = \frac{Y' + \alpha}{\beta}$, the predicted terms of trade. Define Z_c as being Y'/X_c (not the only possible definition), then the equation for predicted purchasing power is $Z_c = \frac{Y'\beta.}{Y' + \alpha}$. Hence, since $Z' = Y'/X'$, $Z'/Z_c = X_c/X'$.

$$Z_e = \frac{2}{1 - \frac{85}{Y'}}$$

as a starting point, but I would reduce β downwards a little from 2 to say 1·75 and I would add on a trend expression such as would raise Z_e by ¾ per cent., compound, per annum.

Policy:—on the view that the curves are relevant to policy with regard to the level of foreign trade, one can say this much: the elasticity at the point where we are now is extremely low. In fact it seems that, of late, every £3 of extra exports (volume at 1953 prices) has been bringing in only about £1 of extra imports.[3] Indeed, the whole of the increase in exports since before the war has been distinctly unproductive: a 75 per cent. increase in their volume has yielded only a 40 per cent. increase in command over imports, i.e. the historical arc-elasticity was about one half ! Any kind of economic policy, therefore, which aims at increasing exports at all costs, without first making sure that there is some good reason for expecting to escape from the historical curve, is clearly misguided: the marginal rate of substitution between food (imports) and manufactures (home produced) is surely not as high as 3 : 1. Nor surely, however high, is the marginal cost in real resources of expanding British agriculture. As a result of this investigation I have been led to the heretical view

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[1] I am indebted to Mr. Christopher Dow of the Economic Section of the Treasury, for suggesting that I investigate for evidence of secular trend in the post-war data.

[2] A rise of ¾ to 1 per cent. p.a. in Z_e for given Y' implies, at the present position on the curve, a rise of about 1 to 1½ per cent. in Y_e for given X' ; that is to say, a 1 to 1½ per cent. rise in the Demand for British exports at given terms of trade.

[3] Elasticities at other points are as follows:—

Volume of Exports 1930–38=100	*% Increase in Volume of Exports required for a 1 per cent. increase in the total import-purchasing power of exports*
100	2·2
140	2·65
160	2·9
165	2·95
170	3·0
180	3·1
200	3·35

that the country is probably exporting too much, and to its unfashionable corollary that (effective) subsidies to agriculture should be increased rather than diminished.[1] On those who disagree, I think there lies the burden of showing exactly why they think the elasticity of the " true " transformation curve is so high as their opinion implies. As a matter of fact, at the present time I cannot see any particular reason for expanding exports unless a more than proportionate increase in imports is obtained, and it is a far cry from an elasticity of 1/3 to one of over unity.

Whenever a statistical argument leads to the conclusion that there should be a radical change in some aspect of economic policy, it is almost inevitable to receive some reply to the effect that the statistical method is insufficiently conclusive to warrant the necessary political decisions. The existing policy is therefore continued. The tragic fallacy contained in this attitude has bedevilled official (and unofficial) discussion of economic policy ever since the end of the war. The government is not pursuing a completely *laissez-faire* policy, it is already pursuing a positive policy, with positive objectives. Those objectives, whether we like it or not, subsume implicit magnitudes to a whole host of elasticities, linear parameters, constants and the like which are popularly believed to belong only in the lecture room. The difference between those magnitudes and the magnitudes suggested as a result of analysis such as that which, with all due diffidence, is offered above, is that the latter are based on some sort of systematic examination of the relevant facts, the latter on little or none. However weak the position of the applied economist trying to do the sort of thing done here, the position of policy-makers who refuse to consider such methods must be weaker.

Specifically, at the present time, Her Majesty's Government is pursuing the following, clearly identifiable, lines of policy towards foreign trade:—

(i) exports, in almost all circumstances, are a Good Thing;
(ii) wage increases should be discouraged if they would adversely influence exports;
(iii) artificial support for agriculture should be soft-pedalled for the time being.

In other words, an expansion of the general level of foreign trade is to be desired. Now, we know that such an expansion will in fact only benefit the country if the slope of the foreign transformation curve is above a certain limiting magnitude. If not, it might well be that the standard of living would be raised if money wages were allowed to rise to such an extent that exports were in fact a little reduced (the gain on the terms of trade being less than the loss of welfare due to the reduction in imports); such a possibility seems at last to have occurred to the trade unions in Western Germany, a country which is surely exporting too much if any is. Can official economists produce a statistical (or any other) argument, in favour of Her Majesty's Government's own implicit view of the elasticities, which is less shaky than mine ?

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[1] See E. A. G. Robinson and R. L. Marris, " The Use of Home Resources to Save Imports ", *Economic Journal*, March 1950, and the subsequent Comment and Rejoinder by G. D. A. MacDougal and ourselves respectively (*E.J.*, September 1950, and March 1951). I do not really believe that there are many people now who would accept that the reversal of a policy which implies increasing exports at a marginal gain in imports of only 1 in 3 should be regarded as " exploitation " of the outside world. One can accept, of course, that there is an argument that richer countries should make sacrifices in the cause of a lower general level of world tariffs and a higher general level of world trade: but the United Kingdom has expanded the volume of her imports very considerably since before the war at a cost in terms of real resources (see text p. 23 above) which has been extremely heavy indeed. Surely we might now ask for a breather before making a further contribution to the cause?

APPENDIX A

TESTS OF $Y = \beta X - \alpha$

INDEX NUMBERS, 1930–38 = 100

Y = volume of exports, unadjusted.
X = terms of trade (import prices/export prices), unadjusted.

1. *Estimates for maximum r*

	α	β	r
1920–1938*	—	—	·97
1920–1929*	115	2·14	·95
1930–1938	115	2·15	·90

* excluding 1926

2. *Quality of fit with α and β pegged at round numbers*‡

	α	β	r
1920–1929*	100	2	·95
1930–1938	100	2	·90
1946–1952†	100	2	·87

* excluding 1926.
† excluding 1947.
‡ $r = \sqrt{1 - \frac{\sigma^2_{y_s}}{\sigma^2_y}}$; $\sigma^2_{y_s}$ = unexplained variance.

APPENDIX B

JUSTIFICATION OF THE ADJUSTMENTS

The following are some of the main disturbance types for which adjustment is theoretically required before testing an equilibrium-demand relationship of the type $Y = \beta X - \alpha$.

(1) Restrictions on the *supply* of British exports:—

(*a*) reconversion from war;
(*b*) raw material shortages;
(*c*) excessive internal demand.

(2) Disturbances overseas:—

(*a*) abnormal, and entirely special, trading conditions for some particular group of commodities which form a substantial proportion of British exports;

(*b*) some disturbance to world primary prices, in this case upwards (caused by widespread government stockpiling) occurring in such a way that the normal effect on the demand for British exports—via the incomes of primary producers—is not experienced in full.

2 (*b*) requires further explanation. If the terms of trade move in favour of primary producers with a sudden, abnormal violence, caused for example by speculation induced by political disturbance, by government stockpiling or some such, the incremental receipts of primary producers will tend to be spent with a much larger lag than is usual: indeed, some part may never be spent at all but remain instead as a permanent addition to the reserves of the countries concerned.

Among restrictions on supply, in 1946 the economy was still undergoing reconversion and in 1947 there was the Fuel Crisis. It would be extremely difficult to assess the cardinal magnitude of the effects of these disturbances and little will be lost if we drop the years in question altogether from the analysis. In 1948, most people hold, there still existed a substantial amount of inflationary pressure, despite the fact that production difficulties had been much reduced. Many contemporary writers believed that that pressure continued into 1949 (and was a major cause of devaluation), but dispassionate examination of the historical facts—a good budget surplus, a small positive overall balance of payments and a distinct slowing up of the increase in wages and prices—must now largely destroy such belief. In June next year, 1950, the Korean war broke out, but it seems that the main effects on British trade of this event fell largely in 1951: thus while there is a case for some adjustment of the export results of 1948, those of 1949 and 1950 seem best left alone. In 1951 and early 1952 British exporters of engineering and other metal goods were facing a strong sellers' market, but the reduction in steel output caused by a lack of scrap and pig-iron put a severe restriction on their ability to meet these demands. Later in 1952 there occurred the sharp slump in textile exports popularly known as the Textile Crisis, an event which falls clearly under the terms of item 2 (*a*) in the list of possible disturbances.

All the events so far mentioned lead towards suggestions for adjusting the actual figures of the volume of exports, in the relevant years, on the grounds that if in those years the forces of demand had not been blocked by restrictions on supply, exports would have been higher.

In addition we should probably adjust downwards the terms of trade for 1951 on the grounds of a disturbance of the type 2 (*b*). Certainly the gains of the primary producers in 1951 could not all have been spent in that year: ought we then to adjust the data for the two subsequent years in the opposite direction? Probably, yes. No specific contra-adjustment has been made, but the best way to consider the possible implications is by reference to the table of Z'/Z_e in the concluding sections of the article. Confirmation of the trend hypothesis there advanced is reinforced as regards the year 1953, but made worse as regards 1952. This is rather encouraging, since we know that in primary producing countries where governments have some control in these matters, an exaggeratedly cautious policy with regard to foreign expenditure was pursued in 1952.

The following is a more detailed expansion of the arguments concerning the years 1950 and 1951:—

> First let us remind ourselves that devaluation itself was in no sense an "extraneous disturbance" for the purposes of this analysis: devaluation represented, *inter alia*, a deliberate turning of the terms of trade against ourselves in the hope of encouraging exports. However, just at the time of devaluation and after, world economic activity happened to be moving cyclically upwards, so that the terms of trade could have been expected to have been moving against us, and our exports rising, in any case (see p. 20 above). Home and foreign demand did in fact increase fairly rapidly, but throughout the year 1950 British industry seems to have been pretty successful in expanding output to meet both increases. There are thus no arguments for making adjustments because of restrictions on the side of supply. Would there, perhaps, be a case for adjusting the 1950 terms of trade, as is done for 1951, under the terms of 2 (*b*) above? But the case for this type of adjustment depends, we have seen, on the *rate* at which the terms of trade are changing, and although the rate of change in 1950 was rapid, it pales by comparison with that of 1951; further, the average monthly rate of deterioration in the nine months from devaluation to the outbreak of the war was, if anything, slightly higher than in the six months following to the year's end.

The following is a quantitative application of the foregoing qualitative arguments:—

1948 . . . suppose that that part of the inflationary gap which lighted upon exports represented 1½ per cent. of the G.N.P., therefore raise the index of export volume by 10 per cent.

1949 . . . no adjustment.

1950 . . . no adjustment.

1951 . . . the steel shortage did not become effective until the end of the year and perhaps reduced metal goods exports below the level they would otherwise have reached by no more than 5 to 10 per cent. over the year as a whole, representing a corresponding reduction in total exports of, say, 3 per cent. It is also necessary (see above) to apply a correction of, say, – 5 per cent. to the terms of trade index.

1952 . . . steel shortage in the first part of the year, textile crisis later. Textile exports seem to have been reduced by some 25 per cent. over the year as a whole, the output of the metal-using industries by about 10 per cent. and their exports by perhaps 3 per cent. Taking into account the proportions of total U.K. exports normally accounted for by textiles and metal goods respectively it seems, therefore, that the index of the volume of exports in 1952 should be adjusted upwards by some 8 to 10 per cent.

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Multiplier and Velocity Analysis: A Marriage

By Vera Lutz

I

Introduction

More than ten years ago Professor Samuelson spoke of the unsuccessful attempts that had been made by numerous writers to reconcile multiplier analysis with velocity analysis, attempts which he judged to be either " trivial " or " founded upon error ".[1] It does not seem that during the interval much has happened to modify this view, which is still perhaps that of a majority of economists. Professor Machlup was anxious to defend himself against Samuelson's[2] accusation that he " was among those attempting a ' marriage ' between the velocity and the multiplier approaches " by explaining that his velocity discussion served " merely to arrive at an estimate of the time dimensions of the multiplier effects ".[3] And more recently, Professor Ackley[4] has complimented Mr. Goodwin[5] on having been " careful to recognise that 'velocity has no explanatory value ' but rather merely that ' multiplier analysis can make important use of the rich empirical evidence from monetary studies ' ". Professor Angell's rather lengthy discussion,[6] now more than twelve years old, of some of the connections between multiplier and velocity analysis, in terms which could hardly be called trivial, has passed largely unnoticed.

In this article we shall be concerned purely with certain formal aspects of multiplier analysis, of which we shall represent velocity analysis as one variety. We shall try to show that velocity can be explained in terms of a multiplier sequence, found by a process analogous to that by which the investment multiplier sequence is found, but based on a hypothesis about the nature of the hoarding function which, although probably no less reasonable than that made about the consumption function in the investment multiplier case, gives us the result that velocity tends towards stability unless the function shifts. This is a result which corresponds to what many " velocity theorists " believed but which some " multiplier theorists " claim to have disproved.

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[1] Paul A. Samuelson, " Fiscal Policy and Income Determination ", *Quarterly Journal of Economics*, 1941-42, p. 602.

[2] *Ibid*., p. 603.

[3] Fritz Machlup, " Period Analysis and Multiplier Theory ", *Readings in Business Cycle Theory* (Philadelphia, 1944), p. 220n.

[4] Gardner Ackley, " The Multiplier Time Period: Money, Inventories and Flexibility ", *American Economic Review*, 1951, p. 350.

[5] Richard M. Goodwin, " The Multiplier ", *The New Economics* (ed. Seymour Harris, New York, 1947), pp. 488-499.

[6] James W. Angell, *Investment and Business Cycles* (New York and London, 1941), especially Chapters IX, X and XI.

Since we shall be concerned exclusively with multiplier *mechanics* we shall formulate the whole of the argument in terms of money flows. We shall assume that no price changes occur, and no relevant changes in income or assets distribution, since such changes are likely to induce shifts in the relevant (aggregate) functions and therefore to introduce a factor which is not germane to our main argument and which we do not propose to treat.

We shall be concerned only with expansionary processes; and we shall treat our problem in terms of a closed system.

II

ALTERNATIVE MULTIPLIER EQUATIONS

Starting from the relationship between money income, and consumption and investment expenditures expressed in the familiar identity

$$Y = C + I$$

where Y is the money income of a given period, C is the consumption of that period and I the investment, we may establish various alternative " multiplier " equations based on different divisions of the expenditures. For the present we shall consider three such equations.

The first, which has by the usage of two decades come to be called *the* multiplier equation, obtains the figure for income by taking investment as the multiplicand, and using as the multiplier the expression $\frac{1}{1-\alpha}$, where α represents the ratio of consumption to income, or the (average) " propensity to consume ", $\frac{C}{Y}$, and $1-\alpha$ the (average) " propensity to save ". This we shall call, following Keynes' original terminology, the " investment multiplier ".

A second formula, which has only rarely been used in the literature,[1] takes consumption as the multiplicand; and the multiplier expression is then $\frac{1}{1-\beta}$, where β represents the (average) " propensity to invest ", or, that is, $\frac{I}{Y}$, and $1-\beta$ what Lange[2] called the " reluctance to invest ". This may, by analogy with the first, be called the " consumption multiplier ".

The third expression, which has crept into the literature sometimes overtly and sometimes only hidden between the lines, identifies the multiplicand with the amount of new money, M_1, created in the period, independently of whether that money is initially spent for investment or consumption purposes. The multiplier is then $\frac{1}{1-\gamma}$, where γ stands for the (average) " propensity to spend ", again whether for consumption or investment purposes, and $1-\gamma$ for the " propensity to hoard ". In this case I and C in the income equation are each divided into two components, which we may denote by the subscripts a and b respectively, so that if the multiplicand is written $M_1 = I_a + C_a$, $\frac{1}{1-\gamma}$ or what we may call the " new money multiplier " may be written equal to $\frac{I_b + C_b}{Y}$, the identity between income and total expenditures thus being again preserved. The multiplier is here a form of income velocity, different however from that which corresponds to the accepted meaning of the term. We may write this third multiplier equation

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[1] Cf., however, Oscar Lange. " The Theory of the Multiplier ", *Econometrica*, 1943, pp. 227ff.

[2] *Ibid.*

$$Y = M_1 V_1$$

where $V_1 = \frac{1}{1-\gamma}$.[1]

Our third expression evidently bears a close relationship to a fourth multiplier equation, which has a longer history than any of the first three. This is the familiar equation of " quantity theory ", $Y = MV$, where M represents the total quantity of money outstanding, and V the " money multiplier ", or the income velocity of circulation in the usual sense. In this fourth equation the multiplicand, M, includes all past creations of money, instead of, as in the third, only the money newly created in the period. The multipliers are correspondingly different: for since $Y = MV = M_1V_1$, it follows that $V = \frac{M_1}{M} V_1$. We may also write $MV = M_1V_1 + M_2O$ implying a division of the total stock of money into two parts, new and old, which is tantamount to regarding the velocity of the old money (M_2) as zero, or, that is, to treating the old money as though it had all gone into hoards. It may be noted that this procedure of separating out the new from the old money implied by the third multiplier equation has its exact counterpart in the investment multiplier equation: for there too investments which took place prior to the period concerned are treated as being irrelevant to the determination of the income of that period.

We thus have three multiplier equations, all satisfying the identity $Y = C + I$, as follows:—

(1) $Y = \frac{1}{1-\alpha} I$, where $I > O$ and $O < \alpha < 1$;

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[1] γ in this expression has been identified by some writers with the sum of the propensities to consume and invest, i.e. with $\alpha + \beta$. We shall comment on certain inconsistencies of this treatment in a later section (see p. 42 below).

(2) $Y = \frac{1}{1-\beta} C$, where $C > O$ and $O < \beta < 1$;

(3) $Y = \frac{1}{1-\gamma} M_1$, where $M_1 > O$ and $O < \gamma < 1$;

and we have

(4) $Y = MV$.

All of the first three equations as thus represented are simple rearrangements of the equation from which we started out: like the fourth they are mere definitional or statistical relationships without any causal significance. The multipliers are " static " multipliers.

The principal claim of multiplier analysis is, however, to have provided an explanation of income generation and propagation in terms of a causal process, or dynamic multiplier series, depicting the successive " rounds " of additional income generated by a unit of additional expenditure of the type defined by the relevant multiplicand; a series which, provided we can assume constancy of the marginal propensity[1] to consume, invest or spend, takes the form of the simplest kind of geometric series, and which, under certain circumstances (namely that the marginal propensity is less than unity and that the series is drawn out to an infinite number of terms), sums to a limiting value identical with the corresponding " static " multiplier expression. It is this dynamic explanation which " velocity theorists " are charged by " multiplier theorists " with having failed to give in respect of the formula $Y = MV$.

In each case the working of the multiplier series through time presupposes a lag, or " multiplier period ", between one income " round " and the next. And the customary simplifying procedure has been to assume that the lag is a single one (rather than distributed) and to relate the consumption (or investment, or spending) of any unit period to the income received in the previous period (rather than to a series of past incomes or even expected future incomes). The period has been fairly widely identified with the inverse of what Professor Angell has called the " average circular velocity (per annum) of active money ",[2] resting on the supposition that there is an average " normal " period, determined largely by technical and institutional factors, which it takes for money to complete a circuit from one income recipient to another—a period which, unless conditions are very unstable, changes only very slowly in the course of time. A substantial part of the literature on the investment multiplier has, it is true, been concerned with the difficulty of defining this period rigorously.[1] All that we need remark here, however, is that similarity of the period concept is the one point of contact which has fairly generally been admitted between multiplier and velocity analysis, and that any difficulties of definition that may arise are common to both.

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[1] In order to keep our notation as simple as possible we shall not introduce a different set of symbols to distinguish marginal from average propensities, etc.

[2] Angell, it should be noted, defines " additions to hoards " as " money which is withheld from any sort of spending on goods and services " (*op. cit.*, p. 132), so that " hoards " include funds which are active in a " transactions " sense (as for example in the financial circulation) but not active in income creation.

III

THE INFERENCE FROM MULTIPLIER THEORY OF A DWINDLING VELOCITY

Multiplier theorists have drawn certain conclusions from the results of applying to new money the multiplier $\frac{1}{1-\gamma}$, at which they arrived by direct analogy with the investment multiplier $\frac{1}{1-\alpha}$, concerning the way in which velocity behaves. It follows from the particular dynamic series which underlies this expression (i.e., $1, \gamma, \gamma^2, \gamma^3, \ldots$ where γ is smaller than unity) that the result of a single new injection of money is that income rises very sharply at the moment of the injection but subsequently falls back to its original level, and that the velocity per income period of the new money falls from one to zero.[2] Correspondingly, continual injections of new money at a constant rate, leading to an ever growing volume of money outstanding, would finally serve merely to finance a constant level of money income per unit period. Thus the average velocity of the money stock outstanding would fall continually even when the " propensity to hoard " was constant for all levels of income, and would fall still faster if the marginal " propensity to hoard " rose as income rose.

This reasoning led Samuelson to conclude[3] that the results to be drawn from multiplier analysis showed an inconsistency between the hypothesis (not necessarily irrefutable) of a stable consumption function[4] used in that analysis, and the hypothesis used by the older writers on monetary theory of a stable velocity; and he seemed to think that this alleged inconsistency was a sign that multiplier and velocity analysis were irreconcilable. Similarly, Goodwin wrote[5] some years later that: " The multiplier and the quantity hypothesis " (i.e., the hypothesis of the constancy of the velocity of money) " are contradictory. One may describe the multiplier process in velocity terms, but it may, and ordinarily will, require a variable velocity of all money. Consequently velocity has no explanatory value, since it is to multiplier, not velocity, theory that one has to turn for the explanation of the variations ".

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[1] Cf. for example: Machlup, *loc. cit.*; Ackley, *loc. cit.*; Ralph Turvey, " The Multiplier ", *Economica*, 1948; Richard A. Goodwin, " The Multiplier Matrix ", *Economic Journal*, 1949, esp. pp. 553ff; G. L. S. Shackle, " Twenty Years On: A Survey of the Theory of the Multiplier ", *Economic Journal*, 1951, esp. pp. 255-6.

[2] Cf., for example, Samuelson, " Fiscal Policy and Income Determination ", *loc. cit.*, p. 593.

[3] *Ibid.*, p. 602.

[4] Although stability of the consumption function has usually been represented as a necessary and sufficient condition for constancy throughout the multiplier series of the coefficient α, it would, as Angell has pointed out (*op. cit.*, p. 193), be more correct to say that a stricter condition is required, namely that the function must be not only stable but also so shaped that, at least over the relevant range of income levels, the marginal propensity to consume is constant—rather than falling as income increases, as Keynes and many others have assumed.

[5] Cf. " The Multiplier ", *loc. cit.*, pp. 488-9.

It is the purpose of the next section to show that the hypothesis of a stable velocity can be traced to a multiplier sequence which has just as much explanatory value as any other multiplier sequence, and that there is no necessary conflict between this hypothesis and that of a stable consumption function.

IV

THE MULTIPLIER SEQUENCE UNDERLYING THE HYPOTHESIS OF A STABLE VELOCITY

The argument that multiplier analysis shows that velocity cannot be stable at a positive level depends on the supposition that the shape of the hoarding function is exactly analogous to that attributed to the saving function, i.e., that new hoarding occurs in each period and that it bears a certain proportion to the income received in the previous period. Obviously, however, it is in no way necessary, so long as new investment is taking place (and this is what the continual flow of investment injections commonly postulated in multiplier analysis means), that stability of the consumption function, and of its complement the saving function, should imply a hoarding function of the same form as the latter. And evidently the " velocity theorists " were not assuming that it did have this form. What shape did they suppose it to have? Roughly speaking we may say that they assumed that, so long as there was stability of anticipations about future prices, and of current and expected future levels of interest rates, the function relating hoarding to income would be such that the *total hoards outstanding*, but not additions to hoards in each income period, would bear a fairly constant ratio to income. This is a hypothesis which is strongly suggested by, even if it does not expressly underly, the " Cambridge " real balance equation, has occasionally been quite clearly used by one of the exponents of the latter, Sir Dennis Robertson,[1]

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[1] We hestitate to say that those who used this equation definitely adopted the hypothesis in question, because although they expressed the " total real balances " which people desired to keep as a proportion of their *given* real income level (and, with a constant income period, this would imply also a certain desired proportion of what we have called " hoards " to that income), they rarely indicated how they expected real balances to move in response to *changes* in the real income level.

Robertson did, however, on at least one occasion (*Banking Policy and the Price Level*, §§ 3 and 4 of the Appendix to Chapter V) explicitly use the hypothesis in question. In treating adjustments of the money supply to increased output, due either to increased productivity per head or to a growth in employment (population), he and has, in addition, been systematically adopted by Professor Angell.[1]

Under this assumption additions to hoards will take place only so long as income continues to increase, and will give way to subtractions (dishoarding) whenever income decreases.[2] Net new hoarding (and dishoarding) thus becomes zero as soon as income settles down to a constant level.

The nature of the multiplier series which underlies velocity, given this assumption about the shape of the hoarding function, may be set out in the following manner:—

Let h represent the ratio of new hoarding (or dishoarding) in any period t to the increment (or decrement) in income $(y(t-1)-y(t-2))$ registered in the period $t-1$. Then, in response to the injection of a single unit of new money, we obtain as our income or multiplier series: $a_1, a_2, a_3, a_4, \ldots a_n$, where

$$\begin{aligned} a_1 &= 1 \\ a_2 &= a_1 - h(a_1 - a_0) \qquad [a_0 = O] \\ a_3 &= a_2 - h(a_2 - a_1) \\ a_4 &= a_3 - h(a_3 - a_2) \\ &\cdot \quad \cdot \quad \cdot \\ &\cdot \quad \cdot \quad \cdot \\ a_n &= a_{n-1} - h(a_{n-1} - a_{n-2}). \end{aligned}$$

When all of the members are reduced to expressions that are multiples of $a_1 = 1$, the series becomes:—

$1, 1-h, 1-h+h^2, 1-h+h^2-h^3, \ldots, 1-h+h^2-h^3+\ldots \pm h^{n-1}$, the last term (h^{n-1}) in the nth member of the series being positive when n is an odd number, and negative when n is an even number. Any nth member in the income series is itself the sum of n terms. Summing the positive and negative terms separately and subtracting one sum from the other, we find that it is equivalent to:—

$$S_n = S_{2m} = \frac{1-(h^2)^m}{1-h^2} - \frac{h(1-(h^2)^m)}{1-h^2} = \frac{1-h^n}{1+h} \qquad \text{when } n \text{ is even,}$$

$$\text{or } S_n = S_{2m+1} = \frac{1-(h^2)^{m+1}}{1-h^2} - \frac{h\,(1-(h^2)^m)}{1-h^2} = \frac{1+h^n}{1+h} \text{ when } n \text{ is odd.}$$

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speaks of the public presumably wanting to add to their absolute real hoards an amount sufficient to maintain the old proportion to real income.

We should in any case keep in mind that all of the economists concerned would want to add that the hypothesis of a constant ratio of hoards to income is only a very rough approximation to the truth, since the size of hoards is undoubtedly influenced by other factors besides the level of income, e.g. the level of other assets, the level of interest rates, " involuntary " accumulations of hoards in certain circumstances, as well as changes in expectations about future prices.

[1] Thus Angell supposes (*op. cit.*, p. 161) that " when anticipations are constant " hoards will be a constant proportion of total assets, and argues that movements of income may be taken as a rough index of movements in assets, and that consequently we may infer that the desired hoards will under stable conditions tend to be a constant fraction of income.

[2] As Angell has pointed out (*op. cit.*, pp. 175ff), the dynamic series underlying the multiplier $\frac{1}{1-\gamma}$ could result only from continual upward shifts in the hoarding function when the latter is of the kind here assumed.

In either case $S_n \longrightarrow \frac{1}{1+h}$ as $n \longrightarrow \infty$ provided $h < 1$.

The series representing the *new* hoarding (+) or dishoarding (–) in the successive periods is the following:—

$O, h(a_1 - a_0), h(a_2 - a_1), h(a_3 - a_2), \ldots\ldots\ldots\ldots, h(a_{n-1} - a_{n-2})$. Again reducing the terms to multiples of $a_1 = 1$, we obtain the series: $O, + h, - h^2, + h^3, \ldots$, the nth term being $+ h^{2m-1}$ when $n = 2m$, and $- h^{2m}$ when $n = 2m + 1$. The nth term tends to zero as n tends to infinity. The sum of n terms in this series represents the total (new) hoarding *outstanding* in the nth period. This tends to $\frac{h}{1+h}$ as n tends to infinity.

It will be noticed that the income series is an oscillating series,[1] and that, provided the hoarding coefficient (h) is less than unity, the oscillations become continually smaller as time goes on. The *un*truncated multiplier (or velocity), representing the total income which the unit of money creates over an infinite number of unit periods, obviously tends to infinity. The truncated multiplier (or velocity) referring to the total income created over the first n unit periods, where n is any finite number, increases continually as n increases but is, of course, always finite. The truncated multiplier (or velocity) relating to a *single unit period* oscillates between 1 and 1–h and finally settles down permanently at around $\frac{1}{1+h}$. Theoretically this "final" value is never reached: using a procedure similar to that applied in investment multiplier analysis, we can, however, calculate the number of unit periods, n, after which the velocity for the single unit period will always fall within limits that are smaller than 10 per cent. above or below the "final" value.[2] The number of unit periods required to reach this approximation to the "final" velocity is the lower the smaller is the hoarding coefficient or, that is, the higher is the "final" velocity.

We thus obtain the result which "velocity theorists" gave us to expect, namely that only a certain proportion $\left(\frac{h}{1+h}\right)$ of the new money finally goes into hoards, and that the remainder $\left(\frac{1}{1+h}\right)$ goes into circulating once each income period in the formation of income. Thus even a single injection of new money provides a permanent

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[1] The oscillations will, of course, be reduced if the hoarding outstanding in any period is determined not as a fixed proportion of the income of a single period but as a fixed proportion of the income of a series of periods.

[2] The formula is :

$$n - \frac{\log .1}{\log h}$$

obtained by setting $\frac{1+h^n}{1+h} = 1.1 \left(\frac{1}{1+h}\right)$ or $\frac{1-h^n}{1+h} = .9 \left(\frac{1}{1+h}\right)$

increase in income per unit period. The multiplier itself, that is to say, here acts as a force tending gradually to stabilise the income level.

The effect on income of continual injections of a constant magnitude may be determined by the same summation procedure as is used in all multiplier analysis. So long as new money continues to be created, the income per unit period will under our present assumptions increase without limit. A simple calculation shows also that the average velocity of the growing stock of new money outstanding will fall period by period (but without oscillating) from 1 to the limit $\frac{1}{1+h}$. Thus it is here the average velocity, and not the income level, which settles down to a stable figure in response to constant new injections of money.

We may see the characteristics of the series more clearly with the aid of an arithmetical example. Let us suppose that $h = \frac{1}{2}$. The income series given by the single injection is then:—

$$1, \tfrac{1}{2}, \tfrac{3}{4}, \tfrac{5}{8}, \tfrac{11}{16}, \tfrac{21}{32}, \ldots .$$

and the nth term tends to $\frac{2}{3}$ as n tends to infinity.[1] The income (or velocity) per unit period thus oscillates between a maximum of 1 and a minimum of $\frac{1}{2}$, and finally settles down to approximately $\frac{2}{3}$. Theoretically it will take an infinite time for the velocity per unit period of the new money to reach this " final " value. By substituting $h = \frac{1}{2}$ in the formula given above,[2] however, we find that by the time four income periods have passed following the creation of the new money, its velocity per unit period will already be within 10 per cent. above or below the " final " figure.

We conclude, then, that under the assumption here made about the hoarding function our " new money multiplier ", or marginal velocity, tends to $\frac{1}{1+h}$ per income period (where $h < 1$) or to $\frac{N}{1+h}$ per year, where N represents the number of income periods in one year. And so long as the marginal velocity is the same as the average,[3] the velocity of the new money will tend to the same level as that of the old, and we have as our fourth " static " multiplier equation:[4]

$$Y = M \frac{1}{1+h}$$

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[1] We notice the strong contrast between this series and the series $1, \gamma, \gamma^2, \gamma^3, \gamma^4, \ldots$ where $\gamma = \frac{1}{2}$, which is:
$1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \ldots$
and in which the nth term (representing the velocity per unit period of the new money) tends to zero as n tends to infinity.

[2] Cf. footnote 2 on p. 36.

[3] There is a certain amount of evidence in the literature that some people have thought that, at least at certain stages of economic development, the ratio of hoards to income will rise as income rises. In that case the marginal velocity will be below the average, and the average velocity of the whole money stock will gradually fall as income grows. The fall will, however, be much slower than that assumed by certain of the multiplier theorists.

[4] Cf. p. 32 above.

where Y is the income of one income period, and M the total money stock.

We have so far attached the condition to our multiplier series that the coefficient, h, should be smaller than one. It is easily seen that this is equivalent to saying that the proportion of new money $\left(\frac{h}{1+h}\right)$ that finally goes into hoards must fall short of one half.[1] If the coefficient is not smaller than one we come up against a complication which is common to all multiplier analysis under similar conditions, namely that the income series no longer converges. In the present case the series oscillates perpetually between 1 and 0 when h is equal to 1, and oscillates more and more widely (between positive and negative values) as n increases, when h is greater[2] than 1.

This is not, however, a reason for jumping to the conclusion that high values for h are an inevitable source of instability in the system. They would be such a source (always provided, of course, that the hoarding function did not shift despite violent ups and downs in the income level) were the banking system obliged to adopt one or other of the two injection patterns (i.e., either the single injection or the stream of injections of constant magnitude) with which multiplier theorists have, for the sake of simplicity, most frequently worked. The fact, however, that the second term in our income series is equal to $1-h$ immediately suggests that it is possible to stop the oscillations entirely (and this is true for *all* positive values of h including those below one) by the simple procedure of injecting, in the second period, an amount of money (M_2) equivalent to h times the injection (M_1) of the first period, and making no further injections thereafter. This second injection will suffice to stabilise the average velocity of the total new money (M_1+M_2) from the second period on, and to keep the income constant at the new (higher) level achieved in the first period.

But this is the solution to which Robertson introduced us[3] long ago in answering a rather different, but for some purposes much more relevant, question from the one we have been asking, namely, not what will happen if money is injected either quite irregularly or else at a perfectly constant rate, but at what rate *must* money be injected in order to keep the flow of money income permanently at a new higher level corresponding to a given increase in the rate of output?

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[1] It may be noted that Angell's admittedly very rough annual estimates of the ratio of hoards to the total stock of money in the United States indicate that, over the period (1899-1939) which he investigated, the ratio always came well below this figure. The maximum he arrives at for any year is approximately 40 per cent. (for 1939). Cf. *op. cit.*, p. 144.

[2] In the extreme case where the demand for hoards of the people into whose hands the new money first comes (say by way of Central Bank purchases of securities) is infinitely elastic with respect to income (i.e. the marginal h is infinite) the velocity of the new money will be zero from the first period on, and there will be no income creation whatever even in the first " round ". There are of course no oscillations in this case.

[3] *Banking Policy and the Price Level* (1926), §3 of the Appendix to Chapter V. We need of course to allow for differences in terminology. Thus Robertson's " hoards " cover all cash balances (including, that is, both those that turn over once per income period in the creation of income and those which are " hoarded " in our more restricted sense of the term) ; his " day " takes the place of our income

The solution can easily be generalised to take care of repeated increases in the income level. In order to finance an income level which is increasing at a constant (arithmetic) rate of, say, one per unit period, it will be necessary to inject one unit of money in the first period followed by $1 + h$ in each successive period. The average velocity per unit of the growing stock of new money outstanding again falls gradually (without oscillating) from 1 in the first period (when income increases for the first time) to the limit $\frac{1}{1+h}$.[1] Velocity can, however, as before be *immediately* stabilised at the latter value from any given period onwards by reducing the injection in that period to h, and making no further injections in subsequent periods. It will be noticed that the money injections series here involved diverges very little from a constant series: only the first and last terms are irregular, and they are so only because of the one-period lag which we have postulated between the change in income and the adjustment of hoards. In the absence of such a lag velocity would always be invariable under the assumption we have made about the shape of the hoarding function.

The final question to which the argument of this section leads up is what our assumption about the shape of the hoarding function, and its corollary that in all practically important cases (aside that is from those where it leads to undamped oscillations) velocity tends to stabilise itself at a positive level, implies with respect to possible shapes of the consumption function. Our assumption means that the part of income which is not hoarded (i.e., is available for the remaining purposes of spending on consumption and investment and, possibly, repaying bank debts)[2] is a constant proportion of income (100 per cent.) only

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period, and his " circulation period " is equivalent to $1+h$ times our income period. We have throughout assumed that people adjust their hoards fully to the desired proportion of income in one income period or " day ", i.e. in the period immediately following that in which the change in income first occurs. Robertson's formula is slightly more general, allowing as it does for the possibility that people may spread the process of adjustment over a number of " days ", in which case the injections must be similarly spread.

[1] It would evidently require a constantly rising rate of injection to keep velocity permanently above the " normal " level.

[2] Although it falls outside the declared scope of our article, we may call attention to one point which is connected with contractionist processes but which rounds off our discussion of the factors which led many " velocity theorists " to the view that there is a strong tendency for the velocity of money to be a stabler element than the volume of money itself. It is a familiar argument that in periods of contraction hoards tend to become in part a residual element, i.e. that they are accumulated " involuntarily " with a consequent diminution in the average velocity of the money stock. In fact the possibility which many holders of surplus cash have of using it to repay bank debts, and thus to destroy part of the volume of money, very much weakens, even if it does not eliminate, this tendency towards involuntary hoarding. So long as this outlet for surplus cash exists, it will be a factor allowing the desired " normal " hoarding ratio to be maintained, and therefore helping to keep velocity stable.

when income is constant: the proportion falls when income rises and rises when income falls. If, however, we keep to the postulate usually made by investment multiplier theorists that the dynamic propensity to consume falls short of unity, and if we ignore cases where our hoarding function gives rise to undamped oscillations, there is no obvious conflict between this assumption and the hypothesis of a stable consumption function when the consumption-income ratio is supposed constant for all income levels, and still less when that ratio is supposed to fall as income rises.

V

A Case for the Money Multiplier Equation

The unpopularity which the velocity, or money multiplier, formula has enjoyed in recent years, and the almost exclusive concentration on the investment multiplier, may make it worth while briefly reconsidering some of the factors affecting the relative usefulness of these and other forms of the multiplier equation as analytical tools for dealing with the effects of changes in the level of spending on the flow of money income.

Formally, of course, all of the equations must give us identical results, provided they are all equally well able to take care, under the multiplicand and the multiplier combined, of all the factors influencing the flow of income. The reasons which may cause us to prefer one version to another will evidently depend on what we consider to be the most important conditions that the division between the multiplier and multiplicand should fulfil. These may perhaps be summarised under three points, all of which have been made at some time or other in the literature. First, we should try to preserve the original basis of distinction, which was one between expenditures that are in some way dependent on the level of income (or " derived ") and those that are not thus dependent (i.e., are " autonomous "). This is important if only for the reason that the autonomous category presumably constitutes the controllable, or more easily controllable, element from the policy point of view. Secondly, and for similar reasons, the division ought to be one which defines the " autonomous " expenditures, or injections, in a way which makes it possible to determine their movements statistically. Thirdly, since it is easier, while keeping within the domain of relatively simple formulæ, to handle a fluctuating multiplicand than a fluctuating multiplier coefficient, it will be convenient if the division is also one which places the more stable element under the multiplier and the less stable element under the multiplicand.

The explanation of how the investment multiplier equation came to take precedence over other possible forms is partly historical. The emphasis placed on public works at the time of the earliest discussions of multiplier theory (as for example in Professor Kahn's original article) was a powerful factor causing the accent originally to fall on the type of injection represented by government expenditures. One of the first questions to be raised, however, was what should be done with decreases in private investment that might be caused by the government investment, or, contrariwise, with increases in private investment that might be induced (whether through the acceleration principle or otherwise) by the additional consumption expenditures out of the income created by the government spending. And it was rather generally conceded that these might be treated respectively as reductions in, or additions to, the multiplicand, even though this procedure obviously blurred the distinction between autonomous and derived expenditures, and confused part of the " effect " with the " cause ".[1] It thus gradually became a widely accepted practice to identify the multiplicand or " injections " with " investments in general ". And Keynes justified the granting of the primary rôle to investment on the ground that " it is usual in a complex system to regard as the *causa causans* that factor which is most prone to sudden and wide fluctuations ".[2] The justification seemed the stronger in that this solution left the multiplier rôle to the propensity to consume, which many believed to be fairly stable over relatively long periods. Thus many economists were satisfied that this division fulfilled the second and third of our conditions even if not the first.

A slight remaining difficulty concerned the treatment of government deficit spending which took the form of relief expenditures; and the inclusion of these in the multiplicand led Sir Dennis Robertson[3] to remark that this type of consumption expenditures was appointed " honorary investment ". All " autonomous " consumption expenditures, however they might be defined, could of course be treated by the consumption multiplier equation, but this equation suffered from the same defects as the investment equation in more marked degree, while lacking certain of its virtues.

The feeling which remained with many multiplier theorists, however, of the practical importance of preserving the distinction between autonomous and derived expenditures, has led to various attempts to effect some sort of combination between the investment and consumption multiplier forms. Goodwin, for example, wants to include in the multiplicand all " injections ", including those that are for consumption purposes,[4] while apparently retaining the assumption that all investment expenditures are " injections " and none of them spending out of income, the latter evidently consisting entirely of " ordinary consumer expenditures on perishable goods and services ".[1] Others have sought, rather more systematically, to combine " autonomous investment " with " autonomous consumption " under the multiplicand, and " induced investment " with " induced consumption " under the multiplier. The static multiplier equation corresponding to this division has usually been written in the form

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[1] Machlup is among those who have most stoutly objected to this practice. Cf. his *International Trade and the National Income Multiplier* (Philadelphia, 1943), p. 10n.

[2] Cf. J. M. Keynes, " The General Theory ", *The New Economics*, p. 191.

[3] Cf. D. H. Robertson, " Mr. Clark and the Foreign Trade Multiplier ", *Economic Journal*, 1939.

[4] Cf. " The Multiplier ", *loc. cit.*, p. 482, where he says: " Government and private investment are the most important injections, but some part of war or relief expenditures, as well as consumer spending for durable goods, must be included ".

$$Y = A \frac{1}{1-(\alpha + \beta)}$$

where A represents the " autonomous expenditures ", $\alpha + \beta$ the sum of the " propensity to consume " and the " propensity to invest ", and $1-(\alpha + \beta)$ the " propensity to save minus the propensity to invest ".[2] Some of the writers using this formula[3] have identified $\alpha + \beta$ with the " propensity to spend " out of income, which we previously called γ, and $1-(\alpha + \beta)$ with the " propensity to hoard " $(1-\gamma)$. Quite apart from our objections to the implied shape of the hoarding function, this is, however, incorrect *so long as we do not assume that injections of autonomous expenditures are synonymous with injections of new money.*[4]

Two inconveniences stood in the way of the division we have just described if it was really to be one which defined autonomous expenditures as something different from expenditures out of new money. One of these was the obvious difficulty of finding a criterion for separating the autonomous from the derived expenditures—a criterion that would allow us to recognise and measure changes in them. One distinction which early suggested itself was that between government deficit spending on the one hand and all other forms of spending on the other; but this was obviously only of interest in certain historical situations. A more recently developed classification, applying to investment expenditures, defines autonomous investment as springing " notably from changes in technique " and induced investment as

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[1] *Ibid.*

[2] Cf. Samuelson, " Fiscal Policy and Income Determination ", *loc. cit.*, pp. 577f ; and Lange, *loc. cit.*, pp. 231ff.

[3] As for example Lange (*ibid.*).

[4] For so long as we assume that autonomous expenditures are not necessarily coincident with spending out of new money we must allow that the excess of saving over induced investment, represented by the expression $1-(\alpha+\beta)$, may go in whole or in part into financing the autonomous investment or consumption expenditures (under A) rather than into hoards. And conversely, we must allow that part of the investment referred to under β (and perhaps part of the consumption under α) though " induced " by the level of income may not be paid for " out of " income but may be financed instead by new money. All that this means is that, so long as we distinguish the two equations, part of the expenditures that appear under the multiplicand in the money multiplier equation appear under the multiplier in the autonomous spending multiplier equation, and *vice versa.* It also means that the *dynamic* multiplier coefficient $\alpha+\beta$ may be greater than unity, a condition that has usually been excluded by multiplier theorists, probably by reason of a mistaken belief that the fact that the *static* multiplier coefficient cannot assume such values implies a similar limitation on the dynamic coefficient.

"the result of an increase in final demand or sales volume":[1] this is, however, a criterion to which, whatever its analytical validity, it is difficult to give statistical content.

The remaining difficulty was the hesitation which many people felt in accepting the proposition, which was necessary in order to give a stable multiplier coefficient, $\alpha + \beta$, that the "propensity to invest", as well as the "propensity to consume", might be treated as a constant.

It seems fair to conclude that the search for a multiplier formula which is of general application, and which meets all the three tests of a satisfactory division between the multiplier and the multiplicand, leads us back almost inevitably to the money multiplier formula. Two reasons speak strongly in favour of this solution. In the first place, the clearest division of total expenditures into "autonomous" and "derived" which we can hope to make is probably still that which identifies the first with those that are due to the injection of new money into the system, and the second with those that are due to spending out of income, or out of the existing stock of money.[2] In the second place, many will feel, failing empirical proofs to the contrary, that there is still some justification for assuming that the money multiplier coefficient is approximately constant, or shows only small variations about a trend, so long as general economic conditions are fairly stable. This assumption follows from a hypothesis concerning the shape of the hoarding function, and its tendency towards stability so long as expectations are constant, which is probably no more difficult to defend than is the hypothesis of a stable consumption function; and it does not necessarily conflict with the latter.

We are thus back at the old velocity formula. "Velocity theorists" would, we should however add, point rather emphatically at the necessity of qualifying the statement that velocity tends to be stable, so as to allow for effects of shifts, either spontaneous or induced, in the hoarding function. In fact a considerable part of their analysis has been concerned with the factors that are likely to cause marked shifts even over relatively short periods, and among these factors they have stressed price fluctuations associated with excessive movements in the volume of money, i.e., in the multiplicand itself.[1] This theme, however, brings us beyond the scope of this article, which was intentionally confined to considering the multiplier mechanism under the supposition that movements in the multiplicand (upwards) were kept short of the boundary where " unemployment economics " ends and inflation begins, and contained no place at all for deflationary movements. None the less, it is pertinent to remark that many of the factors which " velocity theorists " have considered as likely to shift the hoarding function are among those which we might also expect to cause shifts in the consumption function.

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[1] Alvin H. Hansen, *Business Cycles and National Income* (New York, 1951), p. 190. It should be noted, however, that Professor Hansen himself keeps to the practice of putting induced as well as autonomous investment (and government outlays) into the multiplicand, and only induced consumption into the multiplier. Cf. also J. R. Hicks, *The Trade Cycle* (Oxford, 1950), pp. 59ff.

[2] This formula has sometimes been criticised on the grounds that it fails to take account of the importance of the method of injection, i.e. of the fact that it matters into whose hands the new money first comes, as for example whether, in the first stages of a "reflation," it comes into the hands of people who have a high propensity to hoard or into those of groups who have a low propensity to hoard. The problem created by the fact that different groups have different propensities (whether to hoard or to consume), so that the average for the community as a whole alters with changes in income (or assets) distribution, is, however, common to all multiplier analysis which abstracts from such changes. All simple multiplier formulæ which treat the economic system in terms of single aggregates are, that is to say, equally rough instruments, and liable to be misleading if we let the appropriate qualifications slip from our sight.

We conclude, then, that while it may very well be useful for certain purposes and in certain conditions to separate out one class of expenditures (such as investment, or some particular type of investment) as the prime mover of changes in the flow of money income, each of the formulæ which does this is only of limited applicability, and that in many cases it will be more useful to take the formula in which the quantity of money is the multiplicand and the income velocity the multiplier. It has been the purpose of the present article to show that this last formula (to which many of those who explicitly claim to use the investment multiplier implicitly have recourse) is just another species of the multiplier genus, and not a different type of analysis with less explanatory value. This is not to deny that here too there are many practical and conceptual difficulties in drawing hard and fast demarcation lines between the multiplicand, the multiplier, and the multiplier period, e.g., of defining unequivocally the volume of money as distinguished from the velocity of that money, or of determining what changes in the latter are due to changes in the income period and what due to changes in the propensity to hoard. But in this it is not different from the investment multiplier, as the perennial discussion of the corresponding problems in the literature shows.

Zürich.

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[1] They have also observed that the income period might undergo marked changes under such conditions, thus affecting the ratio of velocity per calendar period to velocity per income period.

The Miners' Association of Great Britain and Ireland, 1842-48 :

A Study in the Problem of Integration[1]

By A. J. Taylor

From the beginning of the nineteenth century the development of the British coal industry has been conditioned by the interplay of two conflicting groups of forces, the one making for continuing variation and disunity in the industry, the other for its co-ordination and integration. On the one hand are the immutable facts of differing geological and geographical circumstance, on the other those physical and economic forces which, reinforced at times by deliberate state action, have produced an increasingly integrated national economy. Nowhere is this dichotomy more apparent than in the developing structure of miners' trade unionism. Fundamental problems which have been the concern of miners' leaders for over a century first presented themselves in the years which saw the advent of the railway and the beginning of state intervention in coalmining.[2] A study of the first national miners' trade union is, therefore, of interest for the light which it throws not only on the early history of workers' combination but on a basic and continuing problem of the British coal industry.[3]

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[1] Summary accounts of the Miners' Association are to be found in, *inter alia*, S. and B. Webb, *History of Trade Unionism* (1894), R. Galloway, *Annals of Coal Mining and the Coal Trade* (Newcastle, 1904) and H. S. Jevons, *The British Coal Trade* (1915). More extensive references to the Association's activities in Northumberland and Durham are in R. Fynes, *The Miners of Northumberland and Durham* (1873) and E. Welbourne, *The Miners' Unions of Northumberland and Durham* (1923).

[2] Ashley's Mines Regulation Act of 1842 (5 and 6 Vic., chap 99) which imposed restrictions on labour supply was the first direct state intervention in the economy of mine-working. Previous legislation had been principally concerned with the *coal-trade;* there were already nearly 200 regulations and statutes touching the coal-trade in 1825 (E. Mackenzie, *A View of the County of Northumberland* (1825), p. 156).

[3] It is interesting to note that just as the mineworkers were first to respond to the impulses of a national market, so they reacted most rapidly to similar developments in the international field. The following resolution was adopted by the Miners' National Union Conference on the 9th October, 1889.

> " That in the opinion of this Conference an International Miners' Congress has become an absolute necessity when we consider the immensely increased powers of production which have taken place in every country and the easy and cheap means of transit from nation to nation. . . ."

(Quoted by R. Page Arnot, *The Miners: A History of the Miners' Federation of Great Britain 1889-1910* (1949), p. 155.)

I

The Miners' Association of Great Britain and Ireland, formally established at Wakefield on November 7th, 1842,[1] was not by any means the first British combination of mineworkers. Ever since the repeal of the Combination Laws in 1824—and indeed overtly or otherwise before that time—miners had combined to assert or defend their claims and rights. In 1831, that year of prodigious working-class activity in both the political and the industrial field, miners' unions had sprung up in almost every coal-district, demanding—and frequently winning—increased wages and reduced hours.[2] At one point, delegates of a group of these local unions in the North Midland coal belt—North Wales, Staffordshire, Lancashire, Cheshire and the West Riding—came together at Bolton;[3] but, this very limited and short-lived liaison apart, there is no evidence that the activity of these district unions was in any way co-ordinated. Each union represented the essentially local reaction to powerful factors working in the economic and political life of the nation as a whole.

During the 1830's the miners and their unions passed through many vicissitudes. Miners' wages and conditions fluctuated with the price of coal and the ebb and flow of the business cycle. In the mid-thirties the railway boom brought rewards to the miner beyond those won in 1831 but these were generally more than offset in the depression which followed the collapse of the boom and in the midst of which the decade came to an end. The unions disappeared, in part, as in Northumberland and Durham, because of direct frontal attacks by the coal-owners, in part, as in Lancashire, because after the successes of 1831 the miners were too ready to rest on their oars and let their organisation collapse.[4] There was a time of militancy and strength in West Scotland and a short-lived agitation against the annual bond on Tyneside in 1836–7;[5] but in general the deteriorating economic position of the miner at the close of the thirties provoked no organised activity on the part of the men themselves.

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[1] A tradition that the Association had an earlier origin, in 1841, apparently derives from Fynes, *op. cit.*, p. 37. Fynes, who was personally involved in the activities of the Association, is generally a reliable authority, if sympathetic to the standpoint of the mineworker; but on this question his view is refuted by all contemporary evidence. This fact is of importance to a consideration of the relationship between the life-history of the Association and the movement of general economic activity. The expansion of the Association took place wholly against the background of the upswing of the business cycle.

[2] For the unions of 1831–32 see P.R.O., H.O. 41/8–10 which, with contemporary newspaper evidence, shows the nation-wide character of activity. For the particular case of Northumberland and Durham see J. L. and B. Hammond, *The Skilled Labourer 1760–1830* (1919).

[3] S. and B. Webb, *op. cit.*, p. 123. There was also a South Wales representative: see A. H. John, *The Industrial Development of South Wales 1750–1850* (Cardiff, 1950), p. 91.

[4] *Manchester Guardian*, January 10th, 1844. (Report of a speech by Mr. Dennett).

[5] First Report of S.C. on Combinations of Workmen, H.C. p. 214 (1837–38), VIII, 1; Galloway, *op. cit.*, ii. 169.

As the months of unemployment, short time and low wages persisted, however, the miners looked again to combination as the means to their economic betterment. The first clear sign of revival came in the late summer of 1842, in Staffordshire, where a strike—of seven weeks at some collieries—ran a course of violence and disturbance.[1] But this activity in the Midlands contributed nothing to, and did not directly influence, the formation of the national association, whose origin and early strength lay north of the Mersey and Humber. The miners of the northern counties had learned one lesson above all others from their past experience: that the strongest weapon in the hands of the coal-masters was the ability to break a local strike by importing " strangers " from other mining areas. Only an organisation with a national basis and membership could counter this decisive advantage, and the Miners' Association therefore sought to bring within itself workers from every mining industry and from every pit and quarry.

The single aim of the union was " to unite all Miners to equalise and diminish the hours of labour and to obtain the highest possible amount of wages for the labour of the Miner ".[2] The Association thus rejected both the co-operative utopianism of Robert Owen and the political Chartism of Feargus O'Connor, and this in spite of Chartist support and suspected Chartist sponsorship.[3] Not only was the offer of O'Connor himself to address a national delegate meeting declined[4] and short shrift given to the political manœuvrings of W. P. Roberts,[5] the Association's own lawyer, but proposals—again inspired by Roberts—to link the Association with the wider trade union movement through the National Consolidated Trades Union were equally firmly scotched.[6]

Supreme authority for the direction of the Association's affairs rested with the National Conference, convened irregularly but at least twice in every year, to which the districts sent delegates.[7] Day-to-day management of the Association's affairs—and effective power—was vested in an executive which early in 1844 became a permanent full-time body.[8] At the local level the union's organisation rested on the monthly district meeting in which each colliery had representation.[9] The districts were charged with the conduct of their own local affairs and were allowed to retain half of the subscriptions collected from their members, but district by-laws had to conform strictly to the general rules of the Association.[1]

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[1] Report of Midland Mining Commission, H.C. pp. xxiii–xxvi (1843), XIII, 1.

[2] *Rules and Regulations of The Miners' Association of Great Britain and Ireland—established at Wakefield, Yorkshire, November 7th, 1842.* Rule I. There is a printed copy of the rules in Newcastle Public Library. A manuscript version with some variations of detail will be found in P.R.O., H.O. 45/O.S./434.

[3] O'Connor and the *Northern Star* claimed credit for originating the idea of a national union.

[4] *Manchester Guardian*, January 6th, 1844.

[5] *Miners' Advocate*, April 6th, 1844. See also p. 48, note 5 below.

[6] *Ibid.*, November 16th, 1844.

[7] Rule III.

[8] *Miners' Journal*, April 6th, 1844.

[9] Rule VIII.

In its methods of recruiting membership—as in other matters—the Association owed much to Methodist influence and example. A large mass membership was first sought through great open-air meetings, the equivalent of the camp-meeting of the Primitive Methodists. The work of consolidating and educating this army of recruits was then carried forward by what was virtually a comprehensive system of local preaching. In Northumberland and Durham, for example, where the work of evangelisation was most thoroughly undertaken, six lecturers covered 113 collieries, each colliery being visited four or five times in the course of seven months. In other districts the Association's missionaries hunted in couples moving from pit to pit to win recruits for the Union.[2]

By the summer of 1843 the Association had gained sufficient strength —its membership in July was claimed as 30,000[3]—to win the high approval of the *Northern Star* and the suspicious watchfulness of the Home Office.[4] At this time two-thirds of the union's membership came from the North-East and the majority of the remainder from Lancashire and Yorkshire. Leadership in the Association thus clearly lay with the colliers of the Tyne and Wear. This, while it brought stability and experienced direction to the Association's affairs, tended to make the needs of the North-East the criteria of the policy of the union as a whole. In no direction was this influence more apparent than in the decision to appoint a full-time legal officer, a step dictated largely by the existence of the litigious binding system in Northumberland and Durham. The Association's law department, by turning the interests of the miners first to the courts through litigation and then to parliament through statute law, gave a decisive and permanent twist to the long-term development of the miners' movement; but more immediately its financial demands—£1,500 to £2,000 in a full year—enormously complicated the problems of the infant union.[5]

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[1] Rules X, IX.

[2] For a fuller account of some aspects of the connection between Methodism and the Association, see R. F. Wearmouth, *Methodism and the Working-Class Movements in England 1800–1850* (1937). In the collection of materials in Wigan Public Library relating to the Pitmen's Strike of 1844 (p. 61) there is a lecturing plan for the North-Eastern area which, in format, is identical with that still used in Methodist circuits.

[3] *Leeds Mercury*, July 22nd, 1843.

[4] *Northern Star*, July 22nd, 1843: North of England Institute of Mining Engineers, MS. Buddle, Place Book, June 23rd, 1843. Buddle here records an interview with Sir James Graham and a request from the Home Secretary to communicate any information about political activity by the Association to him.

[5] For the estimation of the figure see the Lancashire balance-sheet printed on p. 50. For W. P. Roberts see the *Dictionary of National Biography*. Roberts remains a somewhat enigmatic figure, though this is as much the result of the absence of direct evidence about his life as of the sympathies and antipathies he aroused in contemporaries. Of his ability and his loyalty to proletarian causes there is no doubt: but with these qualities went also ill-judgment and apparent avarice.

Financial management is a touchstone by which the effectiveness of every union in the second quarter of the nineteenth century may well be judged. Contemporaries spoke in terms of admiration or awe of the size of the miners' financial reserves. One unfriendly critic referred to the existence, at the end of 1843, of a fund large enough to sustain a general strike for a period of two months,[1] while the sympathetic Engels, writing of the dispute in the North-East which involved over 30,000 men and boys, stated that " the funds of the Union were so considerable that for several months a weekly contribution of 2s. 6d. could be assured to each family ".[2] More recently P. M. Sweezy has asserted even more specifically that early in 1844 the Association had " about £24,000 in the bank ".[3]

An examination of the fragmentary surviving material relating to the Association's finances, however, hardly confirms this impression of comparative affluence. A balance-sheet for the six weeks ending November 11th, 1843, shows receipts of £254 14s. 8d. (almost wholly contributed by the North-East) and expenditure of £230 12s. 8½d., a balance of £24 1s. 11½d.[4] The Association at this time—a period of tranquillity—was barely paying its way. Two months later, at the Manchester meeting, Martin Jude presented a budgetary statement, which confirms this general impression of the Association's finances.[5] His estimates were based on a *per capita* contribution of 1d. per week —the constitutional provision. This would yield the Association a weekly income of approximately £66, of which £48 was to be expended on lecturers' wages, leaving a balance to cover sundry expenses and the loss which each number of the *Miners' Advocate*[6] was incurring. Far from yielding an accumulating surplus, the Association's normal income seems merely to have sufficed to meet its regular expenditure. Of auxiliary sources of income there is little sign. It was not until July, 1844 that a national Law Fund was proposed, and then only on the basis of a weekly subscription of ½d. from each member;[7] and whether even this moderate proposal was implemented is open to doubt. At the same July meeting, with the strike in the North-East already in being for 14 weeks, the Association tardily accepted a proposal for the establishment of a special fund from which any district involved in a dispute could draw support. From the viewpoint of the

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[1] *Manchester Guardian*, December 6th, 1843.

[2] F. Engels, *The Condition of the Working Class in England in 1844* (Translated, New York, 1887), p. 170.

[3] P. M. Sweezy, *Monopoly and Competition in the English Coal Trade, 1550-1850* (Cambridge, Mass., 1938), p. 43. The statement is unsubstantiated, but Sweezy's authority would appear to be Galloway, *op. cit.*, ii, 176. Galloway in his turn offers no substantiation.

[4] *Miners' Advocate*, December 30th, 1843.

[5] *Manchester Guardian*, January 6th, 1844.

[6] *The Miners' Advocate* (initially, the *Miners' Journal*) was published by the Association 51 times between October, 1843 and December, 1847 and subsequently privately on two occasions by W. Daniels, a former editor. It was an unstamped paper and at the beginning of 1844 had a circulation of 10,000 copies at 1d. a copy.

[7] *Miners' Advocate*, July 27th, 1844.

North-East this action was "too little and too late"; and as a provision for the future its yield was too small to give it anything more than token significance. By November a new extraordinary levy was being proposed "to retrieve the funds of the Association".[1]

Such reserves as the Association may have possessed, therefore, do not appear to have accumulated in the hands of the national treasurer. It is possible that district accounts showed more favourable balances; but that, at the beginning of 1844, they amounted in total to anything approaching £24,000 is extremely unlikely. The North-East during 1843 appears to have borne the brunt of the task of financing the general operations of the Association. In this area the local Law Fund constituted a further heavy and constant drain on the pockets of the miners and a large reserve could not have been easily accumulated. In the case of Lancashire it is possible to be more precise. Between the time of the county association's commencement and the beginning of August 1844, £5,041 8s. 8½d. had passed into the district treasurer's hands, and £5,037 16s. 3d. had passed out again. For the next 16 weeks detailed figures of income and expenditure for the district are available.[2] These may be summarised as follows:

INCOME	£	s.	d.	EXPENDITURE	£	s.	d.
Law Fund	743	9	11	Law Department	602	14	8
General Fund	2,363	3	8½	Lecturers' Wages and Expenses	149	11	11
				Local Executives' ditto	150	2	3
				'Victimisation', Sickness and Strike Benefit	2,135	14	0
				Sundries	39	4	9
				Balance	29	6	0½
	£3,106	13	7½		£3,106	13	7½

Far from accumulating a large reserve in this period, therefore, the Lancashire district was only managing to balance its accounts by raiding the Law Fund for general purposes. Its major expenditure was directed to the relief of the sick and injured, the victimised and those members involved in industrial disputes. But in this 16-week period the bulk of payments under this head were made in a single district—Halshaw Moor—out of the 27 in which the Lancashire Association had members. Here, apparently, a dispute persisted throughout the summer, involving upwards of 250 men and absorbing over 30 per cent. of the local association's income. When it had ended, attention was turned to the Ashton-under-Lyne district where, in the spring, there was a dispute at the colliery of Messrs. Lees and Swire. A campaign of attrition, colliery by colliery, if successfully pursued, was perhaps the most satisfactory aggressive strategy which the Association could adopt, but it was open to grave objection when, as in Lancashire, it left the local association without reserves and apparently precluded any contribution being made by the district to the parent Association.[1]

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[1] *Ibid.*, November 16th, 1844.

[2] *Manchester Guardian*, October 9th, 1844, October 30th, 1844, December 11th, 1844. Though the summaries of accounts printed cover a continuous period, there are irreconcilable discrepancies between them in detail; these, in total, amount to less than £3 and do not affect the general pattern of the accounts.

These figures cover a limited field but, in as much as they reflect conditions in one of the Association's major areas of activity, they suggest an organisation living financially from day to day. It would appear also that after the summer of 1844, if not before, the central body was being denied its life-blood by the district branches. The Association had, from the outset, realised the necessity of a regular source of income. Whether it had equally clearly discerned the need for building up financial reserves, or whether it had even been able to ensure the regular supply of the income which its normal expenditure required, is much more doubtful.

During the winter of 1843–4 the Miners' Association moved rapidly from sturdy infancy through adolescence to a precocious maturity. These stages in its development were expressed in three general meetings, at Newcastle, Manchester and Glasgow. At the first, held at the beginning of November, the Association was still concerning itself largely with problems of general organisation; at Manchester it turned its attention to the basic objective of obtaining higher wages and adopted the strategy of restricting output; and, by the end of March, at Glasgow, it was coming face to face with the question of a general strike. Of these three meetings, that at Manchester has left the fullest record of its proceedings, and the lengthy reports in the *Manchester Guardian* of the five-day conference throw much light on the points of strength and weakness of this early trade union.[2] A laudable concern about keeping within the framework of the law and avoiding political entanglements degenerated at times into an almost pathological fear of repressive authority.[3] Vigorous determination to arrive at a clear national policy was compromised by the odd confusion of local and general issues which must have made the ignorant spectator uncertain whether he was at a district or a national conference. The cautious realism of Roberts at every point at which his legal opinion was invoked was in marked contrast to the unrealistic utopianism which he revealed whenever he ventured to comment on questions of more general policy.[4] It was a meeting lacking orderliness in its proceedings but presenting " a candour, an honesty and a singleness of purpose " which the correspondent of the *Manchester Guardian* clearly found impressive.

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[1] A further balance-sheet covering a four-week period in 1845 shows an operating loss of £42 2s. 8½d. (*Manchester Guardian*, January 3rd, 1846.)

[2] *Manchester Guardian*, January 3rd, January 6th, January 10th, 1844.

[3] This was shown notably in relation to the suspected presence of a government agent at the meeting. The agent, a police sergeant, made a report which, for the first day's proceedings, is much less informative than that in the *Manchester Guardian* and, on subsequent days, refers the Home Office to that newspaper's reports. (P.R.O., H.O. 45/644).

[4] e.g. Roberts advised the coal-owners of the country to unite in a national body to negotiate with the Association and the Association thereupon proceeded to elect a delegation to meet representatives of this hypothetical body.

Fortunate in its leaders, possessed of a growing and virile membership and clear-sighted in its general objectives, the Miners' Association yet entered upon the most momentous year in its short history with two sources of potential weakness—financial instability and the problem of reconciling the perpetual conflicts between local and general interests. That the Association failed to come through the year unscathed is a reflection of this dual weakness: that it survived at all is a measure of its strength.

II

The Association's object of diminishing the hours of labour and obtaining the highest possible amount of wages could only be achieved at the expense of either the masters or the consuming public; and of these alternatives the first was on both theoretical and practical grounds the less acceptable. The suggestion was therefore made that the Association should enter into an alliance with the owners on a national basis to secure a general advance in prices and a consequential rise in the return to both employer and employed. As one delegate to the Manchester conference put it: " Hitherto it has been a battle between the masters and the men about wages. Now the miners are determined that it shall be a battle between the masters and the men on one side and the public on the other."[1]

The immediate problem was the creation of conditions which would compel the owners to raise prices. This was to be achieved by restricting output. Henry Berrill, the chairman of the Association, " reminded the (Manchester) meeting that their policy was to make coals scarce; that would give a privilege to the masters that they could not create themselves ". Restriction of output either by masters or men was a practice well known in the coalfields. On the masters' side it could only be effectively adopted when a colliery or group of collieries was able to establish a monopoly of a market, a position more easily attainable before the railway age than after. In the case of the men, a similar monopoly of the labour market was a prerequisite of successful restrictive action, and this monopoly could only be achieved when general demand was high or an effective combination of the workers had been achieved. Where, as in North-East England and in the West of Scotland, combination and restriction on the part of the coal-owners had gone hand in hand, the men had been the more easily led to pursue their own restrictive policies. The United Association of Colliers of the Rivers Tyne and Wear in 1825 had limited the hours of work of its members, if hewers or shift workers, to eight hours a day, or if day workers, to 12 hours a day and their daily earnings to 4s. 6d.,[2] and though the practice of limitation had disappeared with the demise of this association, the idea was never far from the miner's mind. In the West of Scotland restriction had become general after the repeal of the Combination Laws in 1824. At the important collieries of Messrs. Baird in Lanarkshire the daily output (the *darg*) of a collier was reduced by the men from four to two carts between 1827 and 1844.[1] The manager of the Quarter Colliery at Hamilton, Matthew Walker, asserted in 1844 that " with free labour we could have done, during all the last 18 years that I have managed this colliery, with one-fifth fewer hands ".[2] Restriction was conceived in years of adversity as a means of sharing out the available work among the hewing community and, as a result, of preventing or reducing unemployment; but it could equally well be used in times of fuller employment to raise prices and wages. With the still limited facilities available for the transport of coal in the mid-forties and the conditions of highly imperfect competition prevailing in the industry, the success of restriction was not dependent on national conformity. Nevertheless, uniformity was desirable and the Manchester conference sought to secure an agreed national basis for limitation of output. The decision was taken to restrict daily earnings to 2s. 6d. a day from January 15th, 1844.[3] The North-East and Scotland were already limiting production: Lancashire, Yorkshire and Staffordshire now followed their example.

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[1] *Manchester Guardian*, January 10th, 1844.

[2] *Rules and Regulations of the United Association of Colliers of the Rivers Tyne and Wear*. Article vi. (Copy in North of England Inst. of Mining Engineers, Bell Collection, ix, 157).

Restriction, however, was only a means to an end. Its corollary was the negotiation of an alliance with the coal-owners. To further this, the executive formulated an appeal *To the Coal-Owners of Great Britain and Ireland.*[4] After asserting that a strike would be disadvantageous to both masters and men, the statement declared: " We risk ourselves and you your money to dig from the bowels of the earth a commodity on which it may truly be said the existence of Great Britain as a nation depends ". Owing to the " ruinous competition by underselling " in the coal-trade, it continued, " the public . . . reap the benefit without so much as soiling a finger in the dangerous undertaking ". The Association therefore outlined its strategy: " Each colliery owner shall be furnished with a copy of such prices as shall be thought necessary and reasonable, and in which it is intended to go on the principle of making the cost price as far as labour is concerned, equally or nearly so on every colliery in the trade, and to such uniformity of cost price the masters to add what they deem a proper and reasonable return for their capital ".

In the early months of 1844 the mining districts were in ferment. The long depression was a thing of the past. A wave of strikes spread across South Lancashire and into the Midland and North Wales coalfields, unsponsored and disowned by the National Association, but clearly inspired by the proceedings of the Manchester meeting.[1] In no district was there a complete cessation of work but the disturbances were symptomatic of the general restlessness of the mining community, and the successes achieved encouraged clamourings for more general action. This was particularly the case in the North-East where the system of the yearly contract left no safety-valve for the active expression of discontent.

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[1] Report of Commissioner on State of Population in Mining Districts. H.C. p. 32 (1844), XVI, 401.

[2] *Ibid.*, p. 38.

[3] *Manchester Guardian*, January 6th, 1844.

[4] Quoted in full by Fynes, *op. cit.*, pp. 50–1.

The bonds were due for renewal on April 5th, 1844, but it was clear that neither masters nor men were satisfied with the existing position. The masters felt that the activities of Roberts now made the bond of more trouble than value to them[2] and they therefore proposed its replacement by a monthly contract. The men, for their part, called for the introduction of a six-monthly bond, which would enable them to bargain with their employers in October when the demand for coal was running high. They asked further for an increase in hewing prices, varying in size from colliery to colliery but amounting on average to approximately 20 per cent., for an increase in payment for time lost through injury, for the abolition or reduction of fines and for the general restoration of the guaranteed wage.[3] Between two such markedly divergent viewpoints there could be little prospect of compromise; and on March 2nd, 20,000 miners met at Shadon's Hill between Newcastle and Durham to determine a plan of campaign to secure their demands.[4] They postponed a decision on their course of action until after the Glasgow Conference of the parent association but there could be no doubt of what that decision would be.

At Glasgow in the closing days of March representatives of over 50,000 miners[5] assembled, primarily to discuss the question of a general strike of miners. Before the long debate had ended and the votes had been cast it had become abundantly clear that opinion was so divided that a general strike would be a difficult and dangerous undertaking. Nevertheless, for the North-East, action of some kind was now imperative. As a delegate from the area expressed it: " It has come to this : we must do something ".[6] When the votes were counted 23,357 were in favour of strike action and 28,042 against.[7] There could clearly be no general strike; but the North-East was too deeply committed in act and, perhaps more important, in feeling to accept the general verdict. The Conference therefore gave licence to the North-East to stage its own strike. This concession made, the Conference was compelled to sanction similar action by the miners of Yorkshire, Derbyshire and Nottinghamshire, subject to the important provisos that the strikes in these areas should be properly organised and that they were not to take place until the men of Northumberland and Durham had had their wrongs redressed.

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[1] *Manchester Courier*, January 13th, 1844; *Northern Star*, March 2nd, 1844; *Mining Journal*, January 27th, 1844, February 17th, 1844, March 16th, 1844, March 30th, 1844.

[2] A protracted dispute had begun at Thornley Colliery in November 1843 and resulted in the trial of the colliery workers for breach of contract. The principal item of contention was the clause in the bond dealing with fines for short-weight tubs. (See Fynes, *op. cit.*, pp. 38–49.)

[3] *Miners' Advocate*, April 6th, 1844.

[4] Fynes, *op. cit.*, p. 51.

[5] The major areas represented at this meeting were Northumberland and Durham (13,104), Lancashire and Cheshire (8,613), North and South Staffordshire (15,000), Yorkshire (5,011), Scotland (6,219).

[6] *Northern Star*, April 6th, 1844.

[7] 1,528 votes were also cast for a partial strike.

In giving its approval to a district strike the Association had forsaken two of its most cherished principles—the broad strategic goal of securing overall wage increases by creating universal scarcity, and the more general objective of discouraging district, as distinct from national, activity. The deeper implications of this concession to district particularism were hardly likely to be lost on an Executive which for months had striven to maintain its overall authority, but from a strategic standpoint the new policy was not without its merits. At one and the same time it made possible the tieing-up of potential sources of black-leg labour, facilitated the collection of strike funds from those still in work, and presented the employers in the strike area with the prospect of losing markets to competitors from other districts. Superficially, too, the North-East might seem to have been the best area in which to initiate such a policy. The miners had a long, if spasmodic, experience of combination, practical knowledge of the consequences of disunity and, on this occasion, firm organisation, sober leadership and readiness for the encounter. But at all these points the owners could match their opponents in experience and preparedness. The opposing forces were therefore remarkably strong and under such circumstances the terrain of battle was all-important in determining the issue of the conflict.

The successes of the miners at collieries in South Lancashire and elsewhere in the early weeks of 1844 had been achieved against the doubly favourable background of expanding industrial activity and a wintry January. The miners of the North-East had neither of these assets. The market for the area was still largely that for household coal in which the season, the weather and government fiscal policy were as important—if not more so—as the state of general economic activity. The omens were unfavourable to the men. March being passed, the immediate demand for coal was declining and, with it, the owners' incentive to keep their collieries working at all costs. But, more fundamentally, the North-Eastern coal trade was passing through a period of low returns after the large influx of capital and labour in the mid-thirties. Since 1837 there had been a steady decline in the industry's fortunes with wage reductions following in the wake of falling prices. The expansion of sales, to which the industry looked to justify its increased capital commitment, had been impeded by the Government's reimposition of an export duty on coal in 1842; so that the owners' association could contend, in justification of its policy of wage reduction, that while employment below ground had increased by 79 per cent. between 1830 and 1844, the quantity of coal sold had only risen by 53 per cent.—and it was alleged that there had already been a 25 per cent. labour surplus in 1830.[1] In short, few less favourable occasions for a conflict could have been chosen than the spring of 1844.[2]

The story of the great four-months' strike in the North-East has been told elsewhere.[3] The conflict early developed into a war of attrition with the coal-owners the aggressive force. While the masters could hope to compel a decision through the importation of strangers, the men's hope of effective resistance lay in their capacity to attract financial support from other coal-districts. The masters found their strangers—in districts where the Association's writ ran ineffectively or not at all[4]—and evicted the miners to provide the newcomers with accommodation: the men were less successful in their search for money which came in amounts calculated to enhearten rather than to succour. Early in August, the miners' leaders, fearful for the future employment of their most loyal followers, conceded the field, and work was resumed on the conditions laid down by the owners in April.

The miner of Northumberland or Durham who paused in his dismay and destitution to consider what it had benefited him to belong to a national association could hardly have drawn conclusions that would encourage a repetition of the experiment. The Association had failed precisely at those points where its assistance could have been most valuably given. Though, by propaganda and missionary visitation, the Executive had sought to prevent the movement of strangers into the North-East it had done no more than slow down their arrival: and the strikers had failed to secure the financial aid with which alone they could have continued the struggle. Worse than this, however, the Executive had failed to prevent the miners of Yorkshire and the East Midlands from undertaking strike action in the spring of 1844 in direct contravention of the decision of the Glasgow conference. These were local " unofficial " strikes, uncoordinated even within the county areas, and lacking both the Association's blessing and its directing hand. The pattern of industrial conflict was essentially different from that in the North-East. In Northumberland and Durham two mammoth, highly organised, forces were locked in battle. From Bradford to Leicester, on the other hand, employers and men were joined in a series of petty skirmishes. The outcome of these local conflicts varied: much depended on the stubbornness of the individual master and his willingness to run the risk of losing markets to local competitors. The general trend of business activity favoured the men and concessions were frequently won. At Sheffield, however, the owners took the initiative, locking out the men and introducing strangers; and this led to an outbreak of violence unparalleled in the more deeply suffering but more strongly disciplined North-East.[1] Across the Pennines, in the northern district of the Lancashire coalfield, stoppages also occurred, while in Scotland the attitude of the men provoked lock-out action by the employers. As 1844 ended, there was renewed discussion of possible strike activity in South Lancashire.[2]

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[1] Anon. *A Few Friendly Words to the Pitmen of Northumberland and Durham* (Newcastle, 1844. Unpaged).

[2] Some at least of the miners' leaders seem to have been aware of this. Jude was one (cf. Fynes, *op. cit.*, p. 114); and Roberts may well have been another. He is alleged to have written on March 11th, 1844: " The one great thing you have determined upon is to be free on Saturday, the fifth day of October, one thousand eight hundred and forty-four. This will give us time to breathe and recover ourselves and by that time your confidence in each other will be stronger, your organisation more complete and your courage more hearty ". [Cited in *Report of the Special Committee of the Coal-Owners respecting the cessation of work by the Pitmen, read at a General Meeting of the Trade April 27th, 1844* (Newcastle, 1844)]. Later he also stated that in Northumberland and Durham the " union had been almost destroyed by an indiscriminate strike ". (*Manchester Guardian*, January 15th, 1845).

[3] On the conduct of the strike the fullest accounts are in Fynes, *op. cit.*, and Welbourne, *op. cit.* Material on which a more comprehensive study could be based is collected in Newcastle and Wigan Public Libraries and in the North of England Inst. of Mining Engineers (Bell Collection).

[4] e.g. N. and S. Wales and the lead and tin mining districts. A large number of agricultural labourers were also imported from Ireland and East Anglia.

It had been a year of great activity and, superficially, of considerable success for the Miners' Association. Against the one great failure in the North-East could be set a record of wage increases obtained in many districts and the prospect of similar gains in the future. But, judged by more fundamental criteria, 1844 was a disastrous year for the miners' organisation. Northumberland and Durham, only a few months previously the heart and head of the Association, no longer stood at the centre of its activities. Membership and enthusiasm in the two counties had declined, finances were low, and Roberts had been compelled to abandon the district for Lancashire. With the virtual disappearance of North-Eastern leadership all the centrifugal tendencies latent in the Association's structure were brought into play. The successes which groups of miners had achieved at individual collieries in Yorkshire and elsewhere owed little to the Association and indeed argued the advantages of separation. As a new year began, the Association's overall financial position was weaker, its membership smaller and its claim to be an integrated national body much less evident than it had been a year before.

Two years later the downward trend of the Association's fortunes had become even more apparent. In spite of a favourable economic climate, membership had declined, and, significantly, the Association had almost completely lost its hold on the miners of the eastern half of Britain: Martin Jude was working strenuously to revive the Association in the North-East, but the bulk of its 20 or 30,000 members were to be found in Lancashire, Lanarkshire and Staffordshire, while active co-operation was being maintained with an independent union in South Wales.[1] Even within this more restricted geographical framework the emphasis seems to have moved increasingly in the direction of greater district autonomy: it was already a far cry from the brave hopes of Wakefield. Nevertheless, the limited common activity of the Association had in it the promise of realisable achievement and consequent national revival; for attention was now being focussed on the furtherance of legislative measures designed to protect the mineworker. In this new emphasis of policy lay a real prospect of achieving unity among the mineworkers and winning public sympathy and support.

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[1] Broadsheet in Newcastle Public Library Collection: *Gateshead Observer*, May 4th, 1844. (The colliery was that of Hounsfield, Wilson, Jeffcock and Dunn, lessees of the Duke of Norfolk.) As a result of the riot, sentences of transportation, in one case of 15 years, were inflicted.

[2] *Mining Journal*, June 15th, 1844, November 30th, 1844; *Miners' Advocate*, August 24th, 1844, December 14th, 1844.

The promise bore no immediate fruit. From 1846 the career of the Association is increasingly difficult to chart and this, in itself, seems a sign of its retrogression. The *Miners' Advocate* was published for the last time in February, 1848, and with its disappearance went the final record of a national conference.[2] By that time attendance at the delegate meeting had shrunk to a third of what it had been in the Association's heyday. Thereafter there are fleeting glimpses of persisting organisation, mainly on a local basis. Roberts was still active in Lancashire in 1848, revivalist meetings were being held in the North-East in 1849, and there is even reference to the presence of delegates of a national union in South Wales in 1850.[3] But the Association as an effective body had come to an end by 1848, its decline almost certainly hastened by the commercial crisis of 1847.

III

The problem of the relationship between the central and district organisations was of critical importance for early trade unions, and, to a peculiar degree, it was to remain a persisting problem for the mineworkers. The Miners' Association never clearly defined the degree of freedom of action which was permitted to the local branches. Rights and responsibilities were in practice subject to reinterpretation in the light of changing conditions and according to the dictates of expediency. This had the merit of flexibility, but the lack of certainty was undoubtedly a factor of weakness in the Association's structure and encouraged those centrifugal tendencies which contributed to its ultimate decline and dissolution. The Association was not, in conception or by terms of its constitution, a federal body: rather was it a unitary organism which delegated power to district components as the need of the hour dictated. The incapacity of federal unions with weak central executives had been so clearly demonstrated in the previous decade that the Association's founders and leaders were plainly anxious to retain as much authority and power as possible in the hands of the central organs—the national meeting and the executive, the limits to this national control being only prescribed by the state of the union's finances.

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[1] Report of Commissioner on State of Population in Mining Districts. H.C., pp. 9–10 (1847), XVI, 401.

[2] No national conference is recorded after that at Wigan in January, 1847. (*Miners' Advocate*, February, 1847). This in all probability was the final national meeting.

[3] *Manchester Guardian*, November 18th, 1848; *Mining Journal*, September 22nd, 1849; *Ibid.*, June 15th, 1850.

During the period in which Northumberland and Durham had numerical predominance in the Association, the actuality of unity approximated to the theory. The North-East was the sun around which the lesser planets revolved and, so long as this district held a patent supremacy in numbers, in discipline and in organisation, it was neither inappropriate nor unwise that influence and leadership should lie with it. But unity on this single basis had no enduring quality. The destruction of the Association's power in the North-East sent the component parts of the union going their separate ways, and in so doing performed the negative function of revealing, on the plane of labour organisation, a basic problem inherent in the nature of the mining industry.[1] But the contribution of the national Association to the resolution of this perennial problem was not wholly negative; the structural pattern of lodge, area meeting and national conference which it established has been carried forward to all subsequent national miners' unions.

In policy the Association's influence on the future was even more marked. Hitherto the weapons employed by the miners for their economic and social advancement had been wholly industrial, the weapons of restriction and of the strike. Now miners began to seek amelioration of their conditions through legislative and parliamentary activity. In these spheres the Association had been initially on the defensive, seeking to give maximum protection to its members under the existing law. In 1844 it had moved forward to attack the threatening Master and Servant Bill and the bill had been defeated in Committee.[2] For the rest of its life the Association consistently pressed for safety legislation and the appointment of mines inspectors and, thanks in part to the Association's petitioning and in part to the persistent representations of Thomas Duncombe at Westminster, the government was at length moved to introduce legislation in 1850. It was on this foundation that Alexander Macdonald's successful efforts for the appointment of checkweighmen, the improvement of safety regulations and the reform of the Master and Servant law were largely built and the miners' movement thereby given its peculiar political character.

In the fields of organisation and policy, therefore, the Miners' Association can justly lay claim to be the cornerstone of national miners' unionism in Great Britain. But the element of continuity had a more personal aspect. When, in September 1858, Alexander Macdonald came south to Northumberland to revive the idea and practice of national union, it was at Shadon's Hill that he set up his standard. Martin Jude and W. P. Roberts were with him on the platform and Roberts was the principal speaker.[1] Though neither was to take the part in the new association which they had played in its predecessor, their presence was at least symbolic: there had been the laying-on of hands.

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[1] For a consideration of a contemporaneous encounter with this problem by the coal-owners see my " Combination in the Mid-Nineteenth Century Coal Industry ", *Trans. Royal Hist. Soc.*, 5th Series, iii (1953), 23–39. An examination of the most recent attempt to cope with the problem by the mineworkers—the formation of the National Union of Mineworkers in 1945—is made by George R. Brown, " Structural Reform in the British Miners' Union," *Quart. J. of Econ.*, LXVII, (1953), pp. 576–98.

[2] H.C. Journal, May 1st, 1844, p. 254.

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[1] *Colliery Guardian*, September 25th, 1858.

Public Departments and Cheap Money, 1932-38[1]

By D. S. Lees

Public Departments[2] have been connected with Government debt operations for over a century,[3] and at various times their surpluses and deficiencies of receipts over payments have had a significant influence in the security markets. It is the purpose of this paper to examine the importance of these two aspects of Department activities in the cheap money policy of the 1930s.

I

The Departments are an almost indispensable part of modern national debt policy. Before 1914 over 90 per cent. of the national debt was repayable only on Government option, and the Treasury's approach to the market was restricted to a few large conversion operations when the trend of interest rates permitted. Since 1914 the Treasury has been involved in debt operations year by year, mainly as the result of the financing of two world wars, which radically transformed the structure of the debt. If the Treasury were completely dependent on the market for the success of its loans, it would be presented with some serious technical problems of debt management. These problems arise, firstly from the size of Government loans, usually over £100 m. and very much larger than those of other borrowers; and secondly, from the investment habits of the money market, chiefly banks and discount houses. Generally speaking, banks do not like to hold bonds[4] with more than 10 years, and discount houses bonds with more than five years, to run to maturity, and these institutions tend to hold the bulk of the shorter-dated bonds outstanding. If the Treasury were completely dependent on the market, it would almost certainly have to place substantial reliance on the support of banks and discount houses, both in its cash and conversion operations, and issue the appropriate shorter-dated securities. For if the Treasury wished to issue longer-dated securities, it would be faced with the problem of raising £100 m. or more from the general investing public, either to redeem Treasury bills or to repay maturing bonds, both of which would be held by the money market. It is extremely unlikely that such large sums could be raised at one fell swoop without offering highly favourable terms to general investors.[1] On the other hand, the situation could always be eased if the Treasury were prepared to persuade general investors to subscribe to its loans on current market terms by increasing the quantity of money. Complete dependence on the market, then, would seem to involve the Treasury in a conflict between issuing shorter-dated securities to the money market (increasing the liquidity of its indebtedness), issuing longer-dated securities to the general public (increasing the cost of its indebtedness), and increasing the quantity of money.

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[1] This paper is based on a section of a doctoral thesis, " The Treasury and Interest Rates, 1932–39 ", prepared while the author was a research scholar in the University of Nottingham. The author is grateful to Professors E. Victor Morgan, Brian Tew and Bruce Williams for their valuable criticisms of the paper.

[2] The most important of the Public Departments (or Government departments or extra-budgetary funds, as they are variously called) are the Issue Department of the Bank of England, the Post Office and Trustee Savings Banks, and the Social Insurance Funds. The disposition of the securities in the Issue Department (held as backing for the fiduciary issue of notes) is completely under Treasury control. The funds of the other Departments mentioned are controlled by the National Debt Office, the office of the National Debt Commissioners, but run in practice by the Comptroller-General of the Office. The officials of the Debt Office deny that the social insurance funds are used in debt operations. They concede that there is " an element of monetary policy or debt policy " in the investment of the savings bank funds, but the Treasury seems to be most modest and circumspect in its requests. (Public Accounts Committee, Session 1951–52, *Min. of Ev.*, Q. 5697–5821). This lends support to the view generally held that the Issue Department is by far the most important Department in connection with debt operations. See also p. 63, footnote 4.

[3] The first time was in a conversion operation in 1834. (*Report of Select Committee on Savings Banks*, p. 9. H.C. 441, 1858.)

[4] By " bonds " we shall mean Government and Government-guaranteed securities quoted on the London Stock Exchange.

The Departments reduce this conflict to a minimum by relieving the Treasury of an immediate dependence on the market. The ways in which they do so are well known. In the case of a cash issue the Departments are in a position to act as underwriters on behalf of the Treasury; if the loan is not fully subscribed by the public, including the money market, they can supply the balance by running down their holdings of floating debt, and especially "tap" Treasury bills. The Treasury can then sell Department holdings of the loan over a longish period of time as market conditions permit, and replenish Department holdings of tap bills. In the case of a conversion issue the Treasury will want to ensure that the Departments hold as much of the maturing loan as possible. As we have seen, as bonds approach maturity they tend to be held by banks and discount houses, who will not in general be prepared to exchange them for securities of much longer life. If the Departments hold the bulk of a maturing loan, the conversion operation becomes very largely an arrangement between the Treasury and the Departments. And the Departments can usually be sure of holding most of a loan when it matures. The profits of the Issue Department and the savings banks go to the Treasury. If the Treasury is willing to run down these profits in the interests of debt management, the Departments can offer a higher price for the maturing bonds than other financial institutions and the general public can afford, or are willing, to pay.[1] As with a cash issue, Department holdings of the loan can be sold over a period of time.

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[1] Several authorities in the City with whom the writer has talked are of the opinion that it would be well-nigh impossible, save on the most prohibitive terms, to raise such sums from general investors in a very short period. See also *Statist*, April 7th, 1934, p. 528.

With both cash and conversion issues, the Treasury is enabled to disregard the requirements of the money market to a considerable extent, and possibly entirely. At the same time, it can raise large sums of money from the general investing public over a period of time rather than all at once, and thus largely avoid the choice between raising the cost of its indebtedness or increasing the quantity of money. In this way the Departments give the Treasury substantial discretion over the terms of its issues, and especially length of maturities. In effect, the Treasury is enabled to issue the types of securities which suit its general debt policy on more or less current market terms.

II

So much for the advantages of the Departments in debt operations. We must now turn to examine the ways in which the Departments were used in the thirties. Here we are greatly helped by the publication of the quarterly gold holdings of the Exchange Equalisation Account from June 1932 onwards.[2] We can now calculate the sterling assets of the Account (as we shall call it) with fair accuracy at the end of each quarter. On certain assumptions, which on the face of it do not appear unreasonable, it is then possible to calculate the tap Treasury bill holdings of Departments other than the Account[3] (which we are calling Public Departments). Further, as the vast bulk of Department bills appears to have been held by the Issue Department,[4] we shall probably not be in serious error if we assume that purchases and sales of bills by the Departments were financed by corresponding sales and purchases of bonds; that is, total securities in the Issue Department are fixed in amount (apart from changes in the fiduciary issue) and changes in holdings of one kind of security must be accompanied by converse changes in some other kind of security. Put another way, we may regard fluctuations in Department bills as a record of the " switching " activities of the Departments (chiefly the Issue Department) as between bills and bonds. Unfortunately, the record cannot be extended beyond March 1938; after that time the Account is believed to have held large amounts of tender Treasury bills[1] (bills usually issued to the money market) and it becomes impossible to calculate the bill holdings of the Departments.

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[1] N. F. Hall, "Treasury Control and Cheap Money", *Transactions of the Manchester Statistical Society*, February, 1937.

[2] Cmd. 8354 (1951).

[3] See Appendix. Dr. Edward Nevin has published similar figures: "Estimating Departmental Intervention", *Review of Economic Studies*, Vol. XX (I) No. 51, 1952. The author's figures were worked out independently of Nevin's, and although there is broad agreement between the two sets of data, there are some differences. For considerations of space these differences cannot be dealt with here.

[4] The bill holdings of the Post Office Savings Bank, the National Health Insurance Fund and the Unemployment Insurance Fund can be ascertained as at December 31st from published accounts. The highest total was £7m. at the end of 1934. No bills are traceable from Trustee Savings Bank accounts, published on November 20th. The largest amount of bills held by the smaller funds (principally the Local Loans Fund and the Road Fund), whose accounts are published on March 31st, was £15m. at the end of March 1935. It may be, of course, that the bill holdings of these Departments were larger in between account dates, although it is worth noting that all Public Departments, *excluding* the Issue Department, held only £36m. of floating debt (Treasury bills *and* Ways and Means advances) at the end of March 1939. (Answer to a Parliamentary question, quoted in *Financial Times*, November 4th, 1952, p. 4.)

These estimates of Department bills from June 1932 to March 1938 are plotted on the accompanying chart. The major Government debt operations during the period are indicated. The dotted lines represent movements in Department bills which have been inferred from inter-quarter tap bill figures, together with calls on, and repayments of, Government loans.

The chart has several interesting features. First, there is ample confirmation of contemporary market reports of substantial Department support for Government loans. Secondly, it seems clear from the timing of the bill fluctuations that the aggregate resources of the Departments were used for no other purpose than that of ensuring the success of Government loans. Thirdly, it follows that the Treasury did not attempt to lower, or keep down, the bond rate of interest by selling Department bills to the banks and using the deposits created to buy bonds from the general public.[2] Between March 1932 and March 1938 the mechanism worked the other way; the Departments bought about £75m. of bills and, if our assumptions are correct, sold bonds to do so. This requires a little explanation. Department bills were virtually unchanged over the period at £130m. Opportunity was taken, however, to reduce the fiduciary issue by £75m. In this operation the Account sold gold to the Issue Department, which paid for it by transferring an equivalent amount of tap bills to the Account. As the Issue Department is one of the Public Departments, Department bills should have fallen by £75m. In fact they did not fall at all, thus indicating purchases of bills of around £75m. In these years, from the point of view of " switching " operations between bills and bonds, the Departments were tending to keep bond prices down.

The fourth feature of the chart is that the magnitude and regularity of the fluctuations in Department bills are quite different from anything that went before 1932. The sequence of Department bills rising in preparation for a Government loan, falling while calls were in progress, and rising again as the Departments sold their holdings of the loan in preparation for the next issue, can be said to have begun in 1932. Although Department intervention is traceable in the twenties,[3] especially after 1927, it appears to have been relatively small, if one can judge from the relatively small fluctuations in Department bills. It is significant that the fluctuations become large after sterling left gold

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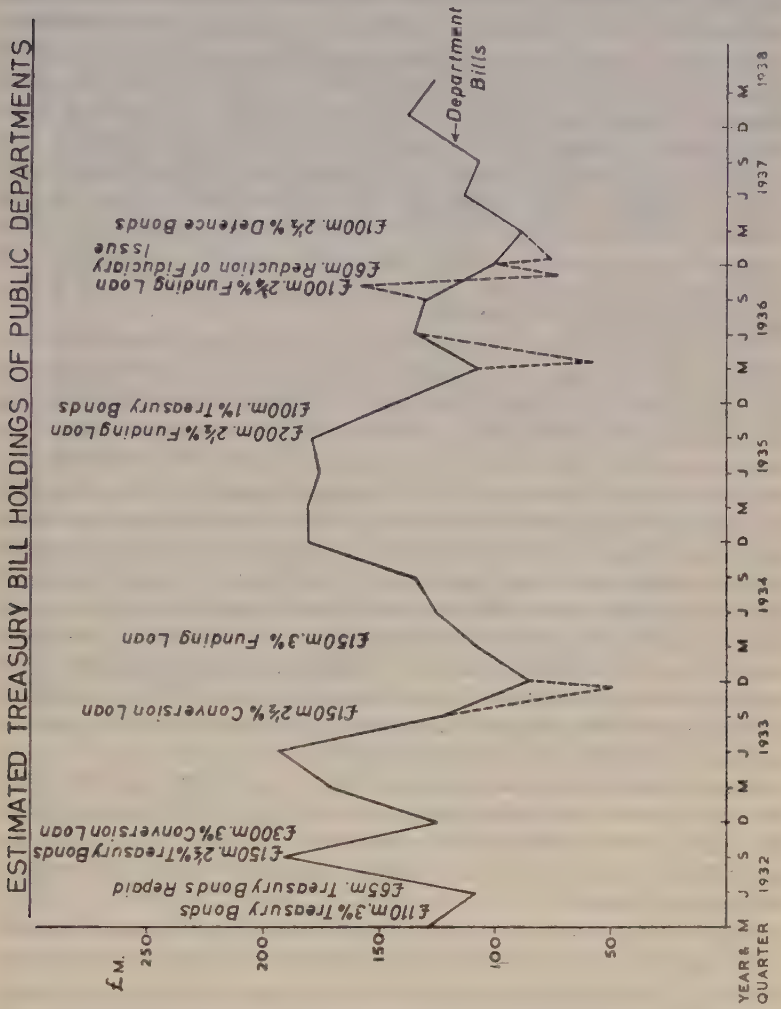
[1] F. W. Paish, *Economica*, 1939, p. 267.

[2] As is believed to have been done on a large scale, 1945–47. W. T. C. King, " Gilt-edged and the Volume of Money ", *The Banker*, October 1946, pp. 7–16.

[3] Movements in Department bills and market reports provide evidence of Department support for Government loans, 1928–31. (F. W. Paish, *Economica*, 1939, p. 253; *Economist*, December 28th, 1928, p. 1222; November 23rd, 1929, p. 980; November 1st, 1930, p. 794.) Movements in Department-held floating debt (more



Ways and Means advances than Treasury bills before 1928) 1925–27 are discernible during periods when loans were being issued. Part of the spectacular fall of £400m. in the tap issue August 1921 to July 1922 may have been due " to a switch from Treasury bills to longer-dated securities by the various extra-budgetary funds, including the Currency Notes Account ". (E. Victor Morgan, *British Financial Policy*, 1914–25, p. 149.) Also there seems to have been only one failure to provide for impending maturities, which involved a rise in the total floating debt in 1929. (Macmillan Committee, *Min. of Ev.*, Vol. I, Q. 3442.) It seems evident that the Departments played some (although probably a smallish) part in the success of the Treasury's debt policy in the twenties.

in September 1931. After that time the Treasury had no urgent need to be concerned about the effects of large movements in Department bills on the Bank of England's control of the money market. It is scarcely conceivable, for instance, that the Departments could have increased their bill holdings by £100m. in one year, as they did in 1934,[1] under gold standard conditions—especially as these conditions demanded high short-term rates 1925–31. There can be no doubt that the Treasury's freedom of manœuvre in this, as in other ways, was greatly enhanced by the suspension of the gold standard. No doubt, too, the larger fluctuations in Department bills are a testimony to the increased scope which the debt technique was given as the Treasury developed and refined its skill and became conscious of its power over the market. There are all the signs of a concerted and systematic policy in respect of the Departments which were at best only vaguely present before 1932.

The Departments seem to have played a minor role in the actual conversion of 5 per cent. War Loan. At one time it was thought that they held about one-third of the Loan.[2] The idea was quickly dispelled by the Financial Secretary to the Treasury, who revealed that " the total amount of 5 per cent. War Loan held by all Government Departments is about £36½m.".[3] The Departments played a larger part in the smaller debt operations of 1932. The fall of £60m. in their tap bills and Ways and Means advances in the second quarter suggests that they took up a large portion of the £100m. Treasury bond issue in April.[4] Department bills rose by £82m. in the third quarter as the Issue Department sold foreign exchange to the Account[5] and bonds held by the Departments matured.[6] This placed the Departments in a strong position to support the various issues made in the last quarter in connection with the great Conversion operation, and it is not surprising to find that their bills fell by £64m.

Department bills rose again by £68m. to £195m. in June 1933, presumably as a result of selling bonds taken up in 1932, in preparation for the Conversion loan of October 1933. This is the first clear-cut example of the Departments " going liquid " in order to support a Government loan.

We shall not attempt any precise quantitative estimates of Department support. Considerations of space alone forbid it, and in any case the amount of speculation and conjecture required, even with the new information to hand, is considerable, and the margin for error is very wide. If we combine our figures of quarterly Department bills with intermediate tap bill figures and market reports, we can state generally that:

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[1] An increase in Treasury bills issued to the Departments means, of course, that fewer Treasury bills are issued to the money market. If at the same time the total amount of Treasury bills is falling, the effect on the money market may be very severe. This was the case in 1934 and the very large increase in Department bills in that year was the main cause of the celebrated " bill famine " and the collapse of discount rates early in 1935. The episode illustrates the power held by the Treasury in the money market in respect of the Departments.

[2] *Economist*, July 9th, 1932, p. 81.

[3] Official Report, Vol. 268, Col. 1304, July 13th, 1932.

[4] F. W. Paish, *Economica*, 1939, p. 255.

[5] " Other Securities " in the Issue Department, believed to represent foreign exchange bought before the Account was established, fell by £40m. in the third quarter.

[6] *Statist*, August 20th, 1932, p. 239.

> (*a*) The Departments took up about three-quarters of the £150m. 2½ per cent. Conversion loan of October 1933[1]; about half of the £150m. 3 per cent. Funding loan of April 1934[2]; rather more than half of the £200m. 2½ per cent. Funding loan of December 1935[3]; about half of the £100m. 2¾ per cent. Funding loan of November 1936[4]; and over four-fifths of the £100m. Defence loan of April 1937.[5]
>
> (*b*) The Departments held "the bulk of" the £50m. Treasury bonds maturing in February 1934 (exchanged for 2½ per cent. Conversion loan)[6]; the £116m. Treasury bonds maturing in April 1934 (exchanged for 3 per cent. Funding loan)[7]; the £150m. Treasury bonds maturing in March 1936 (exchanged for 2½ per cent. Funding loan)[8]; and the £44m. Treasury bonds maturing in April 1936 (exchanged for tap bills).[9]

Tentative as this general evidence is, it seems difficult not to believe that the Departments provided very substantial support for the cash issues of the Treasury, and that conversion operations were largely an arrangement between the Treasury and the Departments. Department support for Government loans after 1932 seems to have amounted to at least half of each issue, and in some cases—notably 1933 and 1937—substantially more than half [10]

By means of these arrangements the Treasury was able to issue types of securities which suited its general debt policy on terms which it could virtually dictate to the market at the time of issue. The types of securities issued were longer-dated bonds which had little appeal to the money market, the one exception being the £100m. 1 per cent. Treasury bond issue in December 1935, which seems to have been fully subscribed by money market institutions.[11] There was no consistent policy over the terms of issue; in 1933, 1934 and 1936 the terms of new Government issues were slightly below current market values, and in 1935 and 1937 slightly above. In all cases, however, Department support was large, as we should expect with an appeal to general investors. One effect of this large Department support was to reduce the immediate significance of the terms of issue; what really mattered was the "tap" price at which the Government broker sold Department holdings of loans in the market.[1] We shall now review briefly this "tap" technique in 1932–37.

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[1] *Economist*, December 9th, 1933, p. 1108; March 10th, 1934, pp. 520–1.

[2] *Economist*, April 21st, p. 877; April 28th, p. 929, 1934.

[3] *London and Cambridge Economic Service*, December 23rd, 1935, p. 380.

[4] F. W. Paish, *Economica*, 1937, p. 344.

[5] *Statist*, June 5th, 1937, p. 879. Also p. 69, footnote 2.

[6] *Statist*, September 30th, 1933, p. 436.

[7] *Economist*, April 28th, 1934, p. 929. *Statist*, March 17th, 1934, p. 3[illegible].

[8] *Economist*, December 7th, 1935, p. 1156. L.C.E.S., March 22nd, 1936, p. 78.

[9] *Statist*, April 18th, 1936, p. 639.

[10] Compare with Nevin, *loc. cit.*, pp. 55–56.

[11] *Economist*, December 7th, 1935, p. 1156.

The technique worked well enough up to 1935, when bond prices were rising. It worked especially well in 1934, when the rise in bond prices was comparable with 1932. For the Departments to market their holdings of 3 per cent. Funding loan, taken up in April, was the simplest of matters.[2] Their bills rose by £73m. in the last three quarters of 1934, tending to support our view that they took up about half the loan at the time of issue. By the end of the year the price of the loan had risen by 6 points, and the Departments must have made large profits on their sales.

The technique worked with diminishing efficacy after the spring of 1935, when bond prices were falling, and ended in something like disaster in 1937. Bond prices fell steadily in the first three quarters of 1936, and the Departments seem to have had great difficulty in selling their holdings of 2½ per cent. Funding loan, taken up in December 1935. In June it was reported that the loan had been "continuously on tap" and that sales of it caused a fall of 1½ points in its price in a week.[3] In July, the *Economist* reported that the Departments "recently endeavoured to pass on large lines of Funding 2½s", but the reception was "disappointing".[4] The fact is that Department holdings of the loan represented stocks which had to be liquidated, and the effect on a falling market was the normal one of depressing it further. In September 1936 Department bills were about £50m. lower than a year previously, suggesting that the Departments still held a large amount of the Funding loan. This is supported by reports that in October sales of the loan were resumed and the "tap" price raised in preparation for the November Funding loan.[5] The operations were carried out in the favourable atmosphere of bank purchases of bonds as their cash reserves were expanded.[6] This is the only discernible time, apart from 1932, when the banks were used to "prepare" the market for a new issue and to facilitate sales of bonds through the "tap" by the Departments.

In the first quarter of 1937 the Departments were caught up in the sharpest fall in bond prices since 1931, to which their sales of 2¾ per cent. Funding loan, taken up in November 1936, must have contributed.[7]

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[1] *Economist*, November 21st, 1936, p. 366.

[2] "The renewed strength of gilt-edged is making possible the placing of large lines of Funding 3's by the Departments". *Statist*, June 30th, 1934, p. 1076; July 14th, 1934, p. 39.

[3] *Statist*, June 27th, 1936, p. 1067.

[4] *Economist*, July 11th, 1936, p. 40.

[5] *Economist*, October 24th, p. 169; November 28th, p. 418, 1936. Bank for International Settlements, *Annual Report 1936–37*, p. 82.

[6] *Economist*, November 21st, 1936, p. 366.

[7] *Economist*, Banking Supplement, May 15th, 1937, p. 9.

The loan dropped to 5 points discount in two months. Department support for this loan may have been large in part because investors held back at the time of issue in the hope that they would be able to buy it more cheaply when the Departments sold their portion through the " tap ", thereby tending to bring about the fall in price they were anticipating.[1]

Depressing as the sales of 1936 and early 1937 were, the Treasury was able at least to mitigate their effect by spreading them over a period of time. If market reports can be relied on,[2] the Treasury was not allowed this grace with the Defence loan of April 1937. The terms of issue were a good point above the market,[3] and the result was " a flop of the first magnitude. The question was not how much was taken up by the Departments, but how did they take it up ".[4] The Departments were believed to have taken up " at least £90m." of the loan,[5] and it was somewhat pointedly remarked that " the technique of pitching the terms of new Treasury issues slightly above the market bears some signs of a bluff that has been called ".[6] The depressing effect which sales of the loan would have had, however well spread, was greatly accentuated by forced sales which the Departments appear to have made to meet calls on the loan. The sales seem to have been almost continuous,[7] and by mid-June the " tap " price had been lowered to 3 points discount.[8] A week later the Departments were reported to be making " desperate attempts to dispose of big lines of Defence bonds, which stand at 4 points discount. The need for some alleviation of these bonds in Department hands is pressing, since on Monday week a final 50 per cent. instalment has to be paid on them ".[9] The effects of the failure of the loan continued to be felt for some months.[10]

The experience 1932–37 suggests the conclusion that the " tap " technique works well in time of depression, when bond prices are rising, and badly in time of boom, when bond prices are falling. Bond prices reached their peak in January 1935, and after that time it became increasingly difficult for the Treasury to market Government loans held by the Departments without exerting a generally depressing effect in the bond market, and an increase in the quantity of money seems to have been necessary in September-October 1936 to enable the Departments to " clear the decks " for the next loan. The failure of the 1937 Defence loan, and the apparent over-straining of Department resources, was not so much the result of the folly of trying to extort an extra point from the market; rather was it the result of attempting to borrow such a large sum from general investors at a time when the boom was nearing its peak, security markets were jittery, and the banks were heavy sellers of bonds. The Treasury did not appreciate—nor, indeed, had it the experience to appreciate—that a technique evolved in time of depression needed modification in time of boom. The chief modification comes down to leaving the Departments with less of Government loans to take up. In other words, the Departments offer little protection to the Treasury in time of boom. It is forced into dependence on the market at the time when concessions to general investors are most expensive, when an increase in the liquidity of the money market is most dangerous, and when an increase in the quantity of money does most harm.

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[1] *Statist*, November 21st, 1936, p. 669.

[2] Unfortunately, movements in Department bills in the second quarter of 1937 are not very satisfactory. Hitherto, our estimated movements in their bills have accorded well with market reports, but this ceases to be so in the quarter mentioned. Between April 24th, the date prior to the issue of the loan, and June 26th, the total tap issue fell by only £42m. In the second quarter the Account's sterling assets (tap bills) were reduced by £69m. as a result of its heavy gold purchases, and between the dates mentioned they could hardly have been reduced by less than £50m. This would mean that Department bills had *increased*. But " even with fresh funds from part-paid bonds and new resources, the bills of the Departments must have fallen by at least £25m." (F. W. Paish, *Economica*, 1937, p. 345). The explanation of the discrepancy mav lie in sales of tap bills directly to the market by the Account. (*Statist*, June 12th, p. 920; June 26th, p. 1003, 1937.) This would tend to obscure any fall which took place in Department bills. It might be added that there is no evidence to suggest that such sales of bills took place at any other time.

[3] *Economist*, May 1st, 1937, p. 284.

[4] Paul Bareau, *The Banker*, May 1939, p. 176.

[5] *Statist*, June 5th. 1937, p. 879; *Economist*, May 23rd, 1937, p. 461.

[6] *Economist*, May 1st, 1937, p. 290.

[7] *Statist*, July 12th, 1937, p. 40.

[8] *Statist*, June 19th, 1937, p. 962.

[9] *Statist*, June 26th, 1937, p. 1003.

[10] *Financial News*, Annual Banking Review, March 28th, 1938, p. 6.

By 1937, however, the technique had enabled the Treasury to carry out its main debt objectives, namely, to keep down the volume of Treasury bills issued to the money market (the tender issue),[1] to reduce the volume of short-dated (1–5 year) bonds, and to issue medium- and long-term bonds in their place. In the five years to the end of 1937, the short-term debt had been reduced by £250m. (bonds £200m. and tender Treasury bills £50m.) and medium- and long-term debt increased by £600m. The net increase in the amount of bonds was thus £400m.[2] In addition the Departments bought about £90m. of bills, which were financed by sales of bonds to the public.[3] The total increase in the supply of bonds to the public was thus around £500m., and the increase in the supply of longer-term bonds around £700m. A borrowing policy of this kind accords ill with the concurrent policy of " cheap money ", and must have tended to retard a fall, or to exaggerate a rise, in the bond rate.[4] It is our thesis that the Departments were fundamental to the success of the borrowing policy; they enabled the Treasury to lengthen the maturities of its indebtedness without a violent rise in the cost of borrowing or increase in the quantity of money. Without the power of the Departments it is almost certain that the Treasury would have reduced its short-term indebtedness less rapidly or increased the quantity of money more rapidly. Either course would have meant cheaper money. In short, the Departments enabled the Treasury to pursue a national debt policy wholly inconsistent with the concurrent policy of cheap money.

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[1] On this see F. W. Paish, *Economica*, 1939, pp. 266–67.

[2] These figures are taken from *British Government Securities in the Twentieth Century*, issued by Messrs. Pember & Boyle, for private circulation only.

[3] See Appendix for Department bill figures and p. 64 for explanation.

[4] E. Victor Morgan, " The Future of Interest Rates ", *Economic Journal*, 1944, pp. 343–44.

III

We must now consider the importance of the current accruals of the Departments in the cheap money policy.[1] Here we shall be concerned entirely with the National Debt Office. When we talk of the Departments from now on we shall be excluding the Issue Department unless it is specifically mentioned.

The principal function of the Debt Office is to receive the surplus funds of Departments for which it is responsible and to invest them. The funds are paid into its accounts in Public Deposits at the Bank of England, and then invested by the Bank on the instructions of the Comptroller-General of the Debt Office. The investment is mainly in bonds. Over the years very large sums of money have come to flow through the Bank, acting on behalf of the Debt Office, into (and out of) the bond market.

This is seen in the following table, which sets out the annual purchases and sales of bonds by the four largest Departments 1929–38.[2] As

TABLE 1

BONDS HELD BY THE DEPARTMENTS (Nominal Values)—£m.

End of	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
P.O.S.B. ..	172	159	124	130	158	190	225	263	295	333
T.S.B. ..	83	72	48	47	56	63	76	90	102	120
N.H.I.F. ..	108	109	109	111	113	117	120	122	125	127
U.I.F. ..	—	—	—	—	—	5	19	40	59	65
Total ..	363	340	281	288	327	375	440	515	581	645
Changes ..		–23	–59	+7	+39	+48	+65	+75	+66	+64

Source: Annual Accounts. P.O.S.B., N.H.I.F., and U.I.F., refer to December 31st. T.S.B. refers to November 20th.

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[1] Current accruals seem to have played little or no part in national debt policy and for this reason they were disregarded in the previous section. The only evidence available comes from the annual accounts of the Departments. The amounts of new Treasury securities appearing in accounts immediately following their issue were small—in only one case was the amount more than 6 per cent. of a total issue. In December 1935 the Treasury issued £100m. of 1 per cent. bonds 1939–41, and the accounts of the Unemployment Insurance Fund in December 1936 show a holding of £29m. of this issue. But these operations can hardly be called " supporting " debt policy, as it was the declared policy of the Fund to invest in short-dated securities. (*Annual Report*, Unemployment Insurance Statutory Committee, December 1936). The 1936 Report of the Fund also states that " the weekly surpluses since February, 1936 have been invested in 1 per cent. Treasury bonds ". From this it seems reasonable to deduce that Department support for debt policy involved switching from one type of asset to another and not the investment of current accruals.

[2] These Departments are the Post Office Savings Bank (P.O.S.B.), the Trustee Savings Bank (T.S.B.), the National Health Insurance Fund (N.H.I.F.) and the Unemployment Insurance Fund (U.I.F.). The abbreviations are used in Table 1.

these Departments held about 95 per cent. of all securities invested by the Debt Office, it is safe to disregard the funds of the numerous smaller Departments for which it was responsible.[1]

In these years the Debt Office was without doubt a dominant factor in the bond market. Its heavy sales of bonds (£82m.) 1929–31 must have tended to keep the bond rate up, and its vast purchases (£364m.) 1932–38 must have tended to keep the bond rate down.

The sales of bonds were made by the savings banks to finance the deficit of the Unemployment Fund.[2] In this way the Treasury was able to avoid borrowing directly in the capital markets, presumably in the form of Treasury bills. The arrangement was particularly opportune in the difficult months immediately prior to the suspension of the gold standard. In the first three quarters of 1931 the savings banks advanced £50m. to the Unemployment Fund,[3] and, as their deposits were declining, they had to sell bonds in order to do so. The Bank of England was having difficulty in placing the weekly offerings of tender Treasury bills as it was,[4] and to have increased the bill issue by £50m. by the time of the September crisis would have added greatly to its embarrassment. The Bank's technical management of the money market was facilitated by this method of financing the Unemployment Fund's deficit, and the Treasury seems to have been well aware of the advantage.[5] On the other hand, such large sales of bonds during a scramble for liquidity must have had particularly depressing effects on bond prices.[6]

The bond sales ceased in 1932, when the unemployment deficit became a direct charge on the Exchequer, and the Debt Office became a net purchaser of bonds for the first time since 1927. In the seven years to 1938 the Debt Office bought £364m. of bonds.[7] The tendency for so vast an accumulation to keep bond prices up is obvious. Furthermore, the Debt Office became by far and away the largest institutional investor in bonds. This is shown in Table 2, where Department purchases of bonds are compared with those of the other main institutional buyers, banks and insurance companies.

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[1] In 1935 the Debt Office held 60 accounts. Many of them, however, were small and not more than half were accounted for to the Public Accounts Committee. According to the Comptroller-General of the Debt Office, " a very large number (of the accounts) are things like the National Savings Banks, Military Savings Banks, Indian Army Pensions Funds—a number of small trust accounts like that ". (Public Accounts Committee, Session 1935–36, *Min. of Ev.*, Q. 1849–50). Apart from the four largest accounts, with which we are dealing, funds invested in bonds by the Debt Office amounted to £38m., mainly on behalf of the Treasury Pensions Account and the Local Loans Fund. (Pember & Boyle, *op. cit.*, p. 502). The Debt Office also held £116m. of Victory Bonds surrendered in payment of death duties, to be held until drawn for redemption. This was part of the cancellation activities of the Debt Office and not its investment activities, with which we are concerned.

[2] N. F. Hall, *The Banker*, May 1939, p. 173. The financing was authorised by the Unemployment Insurance Act, 1921, Section 5.

[3] Estimate based on an answer to a Parliamentary question, *Official Report*, Vol. 259, Col. 668, November 17th, 1931.

[4] *Economist*, July 25th, 1931, p. 157. " This was clearly a factor which influenced the decision to raise the Bank rate " from 3½ to 4½ per cent.

[5] Public Accounts Committee, Session 1932–33, *Min. of Ev.*, Q. 1156.

[6] The adverse effects on real investment may have been, and probably were, offset by the consumption expenditure of the Unemployment Fund.

[7] Of this, £281m. represented voluntary saving through the savings banks, and £83m. " involuntary " saving through the social insurance funds.

The total institutional support for bond prices during the period 1932–38 was £813m., of which the Departments contributed £364m. or 45 per cent., and the banks £308m., or 38 per cent. The inauguration of the cheap money policy is seen clearly, a net liquidation of £19m. of bonds in 1931 (due entirely to the Departments) being replaced by a net absorption of £215m. in 1932. Here the stop put to the drain on the resources of the Departments caused by the finance of the unemployment deficit is shown in perspective; had it been allowed to continue the institutional support for bond prices would have been correspondingly less.

TABLE 2

CHANGES IN INSTITUTIONAL HOLDINGS OF BONDS, 1931–38[1] (£m.)

Year	(1) 10 clearing banks	(2) Insurance Cos.	(3) Depts.	(4) Total	(3) as % of (4)
1931 . .	+12	+28	–59	–19	
1932 . .	+175	+33	+7	+215	3·3
1933 . .	+93	+51	+39	+183	20·9
1934 . .	+29	+20	+48	+97	50·0
1935 . .	+11	+14	+65	+90	71·9
1936 . .	+25	+6	+75	+106	74·6
1937 . .	–25	+10	+66	+51	128·9
1938 . .	nil	+7	+64	+71	90·1
Total 1932–38	+308	+141	+364	+813	

The importance of the Departments in total institutional support grew apace, from 3 per cent. in 1932 to 90 per cent. in 1938. The institutional support divides into two distinct phases: the banking phase and the Department phase. In 1932 and 1933 banking support was by far the largest; the banks' investments rose by £268m. or about 68 per cent. of total institutional purchases. The rise of £175m. in 1932 was based on the expansion of bank cash brought about by the gold purchases and open-market operations of the Bank of England. In 1933, despite an increase in bank cash of £6m., bank deposits fell by £42m. Investments rose to fill some of the gap left by a sharp fall in advances, bills discounted and call money. The role of the banks as a significant factor in the raising and maintenance of bond prices appears to have been restricted to these first 18 months of cheap money. In the second phase the major support for bond prices came from the Departments. In the five years to 1938 the Departments bought £318m.

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[1] A similar table can be found in *The Banker*, May 1939, p. 171—
Col. (1): December averages. Source: Bank of England, *Statistical Summary.*
Col. (2): End of December. Source: Annual Insurance Section. *Statist.*
Col. (3): Reproduced from Table 1.

of bonds out of a total of £415m., or about 77 per cent. The insurance companies bought £57m. and the banks only £40m. In these years the banks provided only marginal *direct* support for bond prices.[1]

It is now well understood that a cheap money policy commits the monetary authorities to an increase in the quantity of money. The increase is usually brought about through an expansion of cash by the central bank, which enables the commercial banks to add to their earning assets, including bonds. In this country an additional twist can be given to the technique by using the resources of the Departments, and especially the Issue Department. It is possible for the Departments to sell Treasury bills, which they hold, to the banks and to invest the deposits received in exchange in bonds taken from the general public.[2] In this case there will be an increase only in bills in the banks' portfolios, and not a general increase in earning assets. The result, however, is broadly the same; the public hold more deposits and fewer bonds.

Thus in no significant sense can the bond purchases of the Debt Office be called part of the cheap money policy.[3] They involved the investment of the current savings of the general public and represented, in fact, bond holdings by the public at one remove. Their growth was not part of a conscious policy to influence interest rates. On the contrary, it was mainly the result of the large and rapid rise in domestic activity, to which the reduction of interest rates in 1932 had given such a vital fillip. Rising money incomes and falling unemployment were matched by larger savings and smaller unemployment disbursements.

That is not to say that the savings would have had the same effect had they accrued to, say, insurance companies. There are at least three ways in which the savings may have aided the Treasury in its control of the bond rate. In the first place the savings were concentrated in the trustee market, in which the Treasury exercised strict control over all borrowers in the thirties. Secondly, although we are not sure of the amount of influence the Treasury has over the Debt Office, it seems likely that the timing and direction of the bond purchases would be broadly in accord with current Treasury policy, and calculated

[1] The *indirect* support provided by the banks is dealt with on p. 76.

[2] See R. S. Sayers, *Modern Banking* (3rd edition, 1953), pp. 208–9.

[3] Rather too much has been made of the surpluses of the Debt Office in connection with the cheap money policy. For example, B. C. Hallowell, in his excellent " Study of British Interest Rates 1929–50 ", says that investing annual accruals to Department funds in gilt-edged securities was one of the devices used by the Treasury " to insure its cheap money objective " (p. 18). This view is surely incorrect; the savings were there and they had to be invested. And as the Debt Office had always invested mainly in bonds, there was no point in causing it to do something else during a cheap money policy. On the same page, Mr. Hallowell quotes the *Economist*, November 6th, 1937, p. 269: " Annual accretions of this order (£70m. a year) have undoubtedly played an important part in maintaining the mystique of cheap money ". If that means simply that more savings tend to reduce interest rates, we agree. If it means anything more, it is misleading.

to have the maximum effect on the market.[1] This would be especially true of the savings banks. The funds of the savings banks are guaranteed as to capital and income by the Consolidated Fund, and 80 per cent. of the profits on investments held accrue to the Treasury. Thus, if the Treasury is amenable, in the investment of savings bank funds the Debt Office is largely unhindered by considerations of liquidity and yield, on which other financial institutions must keep a close watch.[2] And thirdly, the Debt Office does not pay income tax and has more scope in the choice of its investments than other investors in bonds.[3]

But when allowance is made for these advantages to the Treasury, the Debt Office was doing no more than invest current savings along with insurance companies, investment trusts, pensions funds, and the like. The important thing is that the Debt Office was investing new savings, not new money.

IV

We must now examine briefly the broad effects of the Bank of England's credit policy on the bond rate. The Bank seems to have pursued a highly cautious credit policy after 1932. As will be seen from Table 3, the expansion of cash reserves and bank deposits was approximately the same in the five years to December 1937 as in the single year of 1932. It is also clear that there was no attempt to drive the banks into the bond market on any significant scale by increasing their cash reserves.[4]

TABLE 3

DEPOSITS AND EARNING ASSETS OF LONDON CLEARING BANKS, 1931–37[5]

December	1931	1932	(£m) 1933	1936	1937
Deposits	1681	1929	1887	2166	2174
Cash	184	207	213	236	236
Bills discounted and call money ..	365	535	430	505	449
Investments	297	472	565	630	605
Advances	900	773	736	860	949

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[1] For example, weekly accruals of £1–2m. might have been allowed to accumulate as Ways and Means advances and then have been invested in bonds, with greater effect than if the savings had been invested as they accrued. Or again, the types of bonds bought might have been selected with a view to supporting certain weak spots in the market.

[2] According to the evidence of the Comptroller-General of the Debt Office before the Public Accounts Committee, " the money coming into the savings banks can be invested with relatively little regard either to liquidity or yield ". Session 1948–49, Q. 353.

[3] Public Accounts Committee, Session 1946–47, *Min. of Ev.*, Q. 2527.

[4] Nor, as we have seen, were the Departments (including the Issue Department) selling bills to the banks and investing the deposits created in bonds. Precisely the opposite; in the five years to 1937 they would seem to have purchased £90m. of bills. See p. 70.

[5] Ten clearing banks. Monthly averages. Deposits are net of inter-bank balances and cheques in course of collection.

Source: Bank of England, *Statistical Summary.*

In 1933 the banks took up bonds not so much because cash was rising as because other liquid assets and advances were falling. The expansion of cash by the Bank simply went to swell the cash reserves of the banks, and their cash ratios were abnormally high at the end of 1933.[1] The expansion is really relevant, then, to the lending policies of the banks after 1933. This is seen in the three years 1933–36; deposits rose by £300m., of which £200m. was due to a further increase in cash reserves and £100m. to running down cash ratios, i.e. using up 1933 cash. These two things enabled the banks to maintain their investments and moderately to increase them in the face of rising advances. In 1937 there was no increase in bank cash for the first time since 1932; " instead the authorities have let the gilt-edged market find its own level, with the banks realising securities ".[2] In so far as it concerned the bond market the Bank's credit policy can perhaps be summed up in this way: it had little to do with the bond purchases by the banks in 1933; it enabled the banks moderately to increase their bond holdings 1933–36; and it caused the banks to sell bonds in 1937.

Credit policy, then, provided the basis for very little direct support for bond prices. On the other hand, it did have the important effect of increasing the supply of bank deposits by £250m., thereby providing *indirect* support for bond prices by increasing the liquid assets of the general public. It seems, however, that owners of foreign balances in London took up most of the increase in bank deposits,[3] leaving the domestic public with few more deposits at the end of 1937 than at the end of 1932. This being so, the expansion of deposits provided purely negative support for bond prices. It protected the bond market from the consequences of a scramble for liquidity by foreigners; it did not increase the liquidity of domestic investors and induce them to take up bonds.

V

We can now bring the threads of our argument together. The Departments played little part in the conversion of 5 per cent. War Loan in 1932, which established Government credit on a 3½ per cent. basis. The operation was too large to be managed by them, and their resources seem to have been pretty fully employed in minor debt operations during the year. The Treasury was compelled to rely on other measures—in particular, a large increase in the cash reserves of the banks, which enabled them to take up substantial amounts of bonds. As foreign balances increased by only £58m[4] in 1932, most of the sharp increase in bank deposits went to the domestic public.

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[1] The banks contended that higher cash ratios were necessary to compensate for the loss of other liquid assets in 1933, due mainly to the heavy funding of bills by the Treasury. (*Midland Bank Review*, September-October, 1934.)

[2] *Economist*, January 22nd, 1938, p. 179.

[3] See the author's article, " The Technique of Monetary Insulation, 1932–37 ", *Economica*, November 1953.

[4] Cmd. 8354 (1951), p. 5.

The cheap money policy after 1932 was a modest and somewhat curious affair. The large sums of money flowing through the Bank of England on account of the Debt Office tended to keep the bond rate down, and they may have been of some tactical importance to the Treasury. But they cannot be regarded as part of the cheap money policy as they represented the investment of new savings and not the creation of new money. The credit policy of the Bank was not vigorous enough to induce (or force) any really significant bond purchases by the banks and so place direct pressure on the bond rate. The expansion of bank deposits, due mainly to rising advances, did not place indirect pressure on the bond rate as the bulk of the deposits went to foreigners and not to the domestic public. On this interpretation, the bond rate would seem to have been brought down in 1932 by the Bank of England acting as the controller of the cash base of the banking system, and thereafter kept down by the Bank of England acting as the investment agent of the National Debt Office.

At the same time the Treasury was continuing its policy of the twenties of funding Treasury bills and converting short-dated into longer-dated bonds. The Departments (particularly the Issue Department) played a vital part in ensuring the immediate success of Government loans on terms favourable to the Treasury. The size of Department support after 1931 was decisive; at the time of issue the Treasury was virtually in a position to dictate terms to the market, though with increasingly serious consequences after 1935. Without this power it is extremely doubtful whether the Treasury would (or could) have pushed ahead so fast with the reduction of its short-term indebtedness. The Departments must be accorded an important place in the shaping of national debt policy in the inter-war years.

The result of national debt operations in the five years to the end of 1937 was a large increase in the supply of bonds to the public and a substantial change-over from short-term to long-term debt. These two things must have had the effect of keeping the bond rate up.[1] Although in these years the surpluses of the Debt Office amounted to £300m., they were not sufficient to absorb the new bonds created by the Treasury. It would seem that the bond purchases of the Debt Office not so much raised bond prices as prevented official borrowing policy from having more adverse effects.

The general result of official credit and debt policies was to leave the domestic public in 1937 with few more deposits and many more bonds than in 1932. It is perhaps not surprising that the 3½ per cent. basis for Government credit won in 1932 proved impossible to consolidate. Nor is it surprising that the general course of the bond rate was in normal and orthodox correspondence with the movement of the trade cycle.[1] Indeed, it seems time to ask seriously whether the operations of the Treasury and the Bank of England after 1932 merit the name of " cheap money policy ".

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[1] And of keeping short-term rates down. One has to look very little further than the fall in the supply of short-term securities, on the one hand, and the rise in the foreign (" outside ") demand for them, on the other, to account for the very low levels of short-term rates in London in the thirties.

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[1] " The decline (of the bond rate to 1935) was probably no greater than can be ascribed to the natural consequences of the depression, and no effort seems to have been made to check the subsequent rise in rates in 1936–38 ". (F. W. Paish, *Economica* 1947, p. 173.) Also, " The fall in rates from the inflated levels of the 1920s is seen in retrospect to have been a development entirely consonant with the underlying conditions of demand and supply in the world markets for capital—a development which it was in the power of monetary policies to ease or retard, but for which we may be excused for hesitating to accord them excessive credit ". (D. H. Robertson, *Lloyds Bank Review*, May 1939, p. 152.)

APPENDIX

ESTIMATES OF DEPARTMENT BILLS

QUARTER ENDING		(1) Gold Purchases of Account. Mn. of fine ounces	(2) Col. (1) at Estimated Cost. £m.	(3) Gold Sales to Bank of England by Account. £m.	(4) Net Expenditure of Account. Col. (2)–Col. (3). £m.	(5) Account's Tap Bills. Capital of Account Minus Col. (4). Cumulated £m.	(6) Total Tap Bills. £m.	(7) Department Bills. Col. (6)–Col. (5). £m.
1932	March	—	—	—	—	—	130	130
	June ..	2·7	15·4	–37·2*a*	52·6	114	223	109
	Sept. ..	3·0	17·7	3·3	14·4*c*	100	291	191
	Dec. ..	–4·4	–27·3	–19·6*b*	–39·7*d*	140	267	127
1933	March	18·9	114·8	52·0	94·8*c*	45	218	173
	June ..	6·4	39·0	17·6	61·4*e*	216	411	195
	Sept. ..	–7·6	–48·3	1·0	–87·3*f*	303	428	125
	Dec. ..	7·8	50·2	0·3	49·9	253	342	89
1934	March	3·4	23·4	0·4	23·0	230	342	112
	June ..	–0·2	–1·4	0·4	–1·8	232	361	129
	Sept. ..	–4·1	–28·4	0·4	–28·8	261	399	138
	Dec. ..	0·9	6·3	0·4	5·9	255	440	185
1935	March	0·5	3·6	0·2	3·4	252	438	186
	June ..	5·6	39·9	0·2	39·7	212	392	180
	Sept. ..	5·2	36·6	0·9	35·7	176	359	183
	Dec. ..	–0·4	–2·8	6·5	–9·3	185	333	148
1936	March	5·5	38·7	0·5	38·2	147	259	112
	June ..	14·0	98·0	15·7	82·3	65	204	139
	Sept. ..	4·1	28·7	32·3	–3·6	69	203	134
	Dec. ..	5·7	40·4	65·1	–24·7	94	202	108
1937	March	1·3	9·2	—	9·2	85	179	94
	June ..	12·1	84·9	12·7	72·2	213	332	119
	Sept. ..	4·1	28·7	—	28·7	184	296	112
	Dec. ..	1·6	11·2	—	11·2	173	316	143
1938	March	1·1	7·7	—	7·7	165	297	132

Notes:

Column 1. Source: Cmd. 8354 (1951).

Column 2. Quarterly average price of gold used to estimate cost. Source: Bank of England, *Statistical Summary*.

Column 3—

a. The Account held 2·7m. ounces of gold (£15·4m.) when it began operations at the end of June 1932. At the same time it appears to have bought £32m. of foreign exchange from the Issue Department, and to have taken over the " loss " of about £5m. on the Bank of England's gold purchases in the second quarter of 1932. (F. W. Paish, *Economica*, 1939, p. 255.)

b. In December 1932 £19·6m. of gold (valued at par) from the Issue Department was used for the U.S. debt repayment. The gold was worth £29m. at the current market price, and the difference of £9·4m. accrued as profit to the Account. (*Economist*, May 15th, 1937, p. 405.)

Column 4—

c. Assume foreign exchange holdings of £32m., i.e. the amount with which the Account began operations.

d. As the Account's gold and foreign exchange reserves appear to have been exhausted in November 1932, it seems reasonable to assume little or no foreign exchange holdings in December 1932.

e. £40m. of foreign exchange. (Cmd. 8354.)

f. Foreign exchange fell to a negligible amount by the end of 1933 and remained so for the rest of our period. (Cmd. 8354.) We follow market reports in assuming that the sales occurred in the third quarter of 1933.

Column 5. The original capital of the Account was £167m., which was raised by £200m. in May 1933 and a further £200m. in June 1937. It was generally believed that the sterling assets of the Account were held in the form of tap Treasury bills up to March 1938. (F. W. Paish, *Economica*, 1936, p. 78; *Economica*, 1939, p. 267.)

Column 6. Source: T. Balogh, *Studies in Financial Organization*, Appendix I to Part II by F. W. Paish. Where the tap issue cannot be calculated for technical reasons, a simple arithmetic interpolation has been taken between the tap figures immediately before and after the end of the quarter. The exceptions to this are March 1936, December 1936, and June 1937. There were large calls on Government loans a few days after these dates and the tap issue fell sharply, indicating substantial intervention by the Departments.

Column 7. The most important assumptions underlying the estimates of the bill holdings of the Departments are as follows:

(*i*) Sterling assets of the Account held in the form of tap Treasury bills;

(*ii*) Gold purchases by the Account not financed by sales of tap bills to the money market. (See p. 69 footnote 2.)

(*iii*) No tender bills bought, or tap bills sold to the money market, by the Departments.

Book Reviews

A Study in the Theory of Inflation. By BENT HANSEN. George Allen & Unwin. 1951. xii + 262 pp. 18s.

The theory of inflation is a vast and disorderly area of economic thought, partly because of the ambiguity of the word inflation itself, and partly because, even when a strict definition is chosen, the ground covered is still extensive, and the choice of assumptions with which to build a model is enormously wide. Dr. Hansen has done two things in this book ; in the early chapters he has developed a set of definitions and identities which serve for the static analysis of an inflationary situation—that is to say, a situation in which there is excess demand in the economy—and subsequently he has developed a number of models of repressed and open inflation which rest, naturally, upon particular assumptions about economic behaviour.

The first of these tasks is undertaken in the first three chapters of the book. The treatment is very general, in that it is not assumed that expected sales or planned purchases coincide either with each other or with the actual supplies available, or that stocks are maintained ; in that public finance and foreign trade are brought into the picture ; that provision is made for distinguishing between the purchases that are really intended and the orders that are placed ; and, above all, that the market for finished goods is distinguished from that for factors of production. The analysis is rigorous, and the resulting sets of identities are, as the rest of the book shows, of use as the basis of model-building and as a guide to the practical calculation of the inflationary gap in the market for goods. The outstanding point which emerges is that the latter, on Dr. Hansen's definitions, is not by any means the same thing as the *ex ante* gap between planned purchases and expected sales ; the difference between the two consisting mainly of the " factor gap " by which realised falls short of expected output.

The first application of this analysis is to the case of suppressed inflation in a perfect market. Entrepreneurs are supposed to plan production at the level where marginal costs equal price, but actual supplies of factors are inadequate for this—that is to say, there is a " gap " in the factor markets owing to factor prices being held below the values of their marginal products. At the same time the planned purchases of finished goods at the prices supposed to rule are in excess of even planned production. The " gap " in the market for finished goods thus consists of the factor gap *plus* the *ex ante* gap in the finished goods market—or rather, of this sum *minus* the reduction in demand which will result from the entrepreneurs' incomes from sales being less than they planned. From this model, Dr. Hansen deduces that a policy of reducing final demand until it coincides with the value of available supplies will not remove inflation; it will still leave entrepreneurs planning to produce more than available factor supplies allow (or than will now be demanded), so that the factor gap will remain, and, if controls are removed, wages will presumably rise. In practice, the danger of this would probably be that it would lead to a raising of prices by entrepreneurs to maintain margins ; this is not considered in this context by Dr. Hansen. In discussing the raising of prices as a separate way of eliminating the inflationary gap he points out that such a policy will succeed in the finished goods market only if the aggregate demand curve for finished goods slopes downwards—that is to say, if a transfer of real income from the hired factors to profit-receivers reduces planned purchases. (The likelihood of this is reinforced by a consideration which receives perhaps less than its due from Dr. Hansen, namely, the effect on demand of falls in the purchasing-power of the money stock.) The moral to be drawn from this model, as one writer[1] has already commented, is that if there is a factor gap as well as a finished goods gap, no single adjustment, either to final demand, to prices, or to wages, will re-establish equilibrium; two gaps demand two adjustments.

After extending his analysis to what we should perhaps not thank the (generally excellent) translator for calling " monopolism ", the author passes to his model of open inflation. This is a particularly elegant one. It rests on the simple assumptions that planned output is an increasing function of the ratio of finished goods prices to factor prices, and that planned purchases are a decreasing function of this ratio. With the additional suppositions that the rates of increase per year of factor prices and finished goods prices are proportionate to the gaps in the respective markets, the model is complete. The student (or collector) of theories of distribution will be pleased to see that this simple model gives a determinate, stable, ratio of factor prices to finished goods prices, and therefore, presumably, of profits to income, towards which the model tends. When this stable relation is attained, wages and prices simply go on increasing equiproportionately for ever. If wages are increased by an exogenous force from their equilibrium relation to prices, then the rate of wage-increase due to the forces assumed in the model is thereafter reduced, and the rate of price-increase increased, until the equilibrium ratio is restored. A series of repeated exogenous wage-increases can keep the actual ratio of wages to prices above its equilibrium value at the cost of speeding price inflation; similarly a series of exogenous price-increases can keep the ratio below its equilibrium value at the cost of speeding wage inflation.

The beauty of this model perhaps conceals its defects. The weakest point seems to be one which is visible in some other parts of Dr. Hansen's book —his treatment of the aggregate demand curve. That aggregate demand for *consumers*' goods is a decreasing function of the ratio of prices to wages is plausible enough; but what about investment ? Might not planned purchases of all finished goods together be an increasing function of the price-wage ratio ? Dr. Hansen assumes a fixed demand for investment goods, but readers may think that this is cheating.

The discussion is extended again to " monopolism ", and then to the multi-product, multi-factor case, and it is shown that again, on the assumptions made, there is an equilibrium (or, as the author calls it, quasi-equilibrium) set of price-ratios. The discussion of monetary equilibrium with which the book ends makes clear the elusive nature of this concept, and will make some readers doubt whether it is really worth chasing. The chase, at any rate, brings the author face to face with the fact that the number of useful generalisations we can make about inflation is very limited unless we know, or can assume, something about the mechanism of the movement of prices, which depends both on institutions and on expectations. Within that area, limited though it may be, Dr. Hansen has made a most distinguished contribution.

A. J. BROWN.

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[1] K. K. F. Zawadzki, *Review of Economic Studies*, Vol. XXI (1).

Consumers' Expenditure in the United Kingdom, 1900-1919. By A. R. PREST. Cambridge University Press. 1954. xiii + 196 pp. 42s.

The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938. Volume I. By RICHARD STONE. Cambridge University Press. 1954. xxx + 448 pp. £5 5s.

These two volumes, each with pages of 12 in. by 10 in., are parts of a brilliantly conceived and executed single work estimating consumers' expenditure in the United Kingdom year by year from 1900 (and for some commodities from 1870) to 1938. In addition, the volume relating to the years 1920 to 1938 analyses human behaviour in response to price and income stimuli and over time. The volumes are a result of team work, and in addition to the authors, involved Messrs. Adams, Paulson, Roy, Corlett, and Rowe, Misses Hurstfield and Potter, and numerous other persons connected directly or indirectly with the National Institute of Economic and Social Research or the Cambridge University Department of Applied Economics.

An important object of the work was to produce a series of tables of statistical material which could be used to test econometric hypotheses. The compiling of these annual estimates of expenditure is a twofold task. First there is the task of collecting the information that exists about prices, quantities and expenditure, then there is the adjustment of that information, mainly by allowing for omissions in data for specific years and interpolating for years in which basic data are not available. The books describe the sources for the first task but do not record the figures collected, they describe the processes of adjustment in general terms but not in quite sufficient detail to enable the reader to repeat the derivation of the figures given. Nevertheless the descriptions go a long way towards avoiding problems of interpreting figures issued by the Government which " frequently leave too much to their reader's imagination ". The tables presented in volume I of the series relating to 1920-1938 cover food, alcohol, tobacco, accommodation, fuel and light ; the volume relating to the earlier period covers, in addition, expenditure on furnishings, clothing, reading matter, travel, amusements and other goods and services.

Life is complex, and the goods and services which can be bought are of infinite variety, yet for use everything must be classified into one or other of a limited number of groups, each of which is then treated as if it consisted of homogeneous items. Hence there is the need for careful description of the methods used in making the limited number of classes. It has been found possible and useful to classify rather more minutely for the period since 1920 than before and this can be illustrated by the first groups of commodities listed, those for bread and cereals. Flour appears as one commodity before 1920 but from 1920 it appears as flour, bread, cakes and biscuits, each with a separate expenditure recorded. This grouping of commodities as if they formed homogeneous groups causes complications throughout, not so much in the estimates of expenditure, but in those of either quantity or price. Expenditure is a precise concept and the exact amount paid, though it may not be recorded anywhere, is a question of fact. By definition this expenditure is the product of a price and a quantity. The total quantity of flour consumed is estimated for these studies; some is bought by the consumers as flour (to be baked into bread or cakes, etc., in the home), some is bought as bread and some in cakes and biscuits. Hence the price for flour before 1920 appears to be a complex and hypothetical average value which must allow not only for the remuneration of the farmer, miller and distributor but also for the remuneration of the baker of bread and part of the remuneration of the maker of cakes and biscuits, the remainder of whose remuneration will be added to the " price " of the fats, sugar and dried fruits used. If the industrial baking of bread, cakes and biscuits increases in importance relative to the use of flour, even if the price of flour, bread, cakes and biscuits each remains unchanged the price of " flour " must be recorded as increasing, unless the other alternative of using an artificial " quantity " is chosen. It is because of such problems as these that the cautious investigator will use the figures only after careful reading of the texts.

The more detailed classification from 1920 will cause difficulties if one tries to use the two books to provide a continuous series ; it would have helped if the figures had overlapped for one year so that for 1920 figures were provided on both bases. A further feature of the decision to provide figures for every year has been the repeated need to resort to interpolation between years for which figures were independently obtained, perhaps as a result of a census of production. It might have been appropriate to print the figures obtained primarily from independent sources in a distinctive type and so help investigators of human behaviour in the future to avoid rediscovering the interpolation formulæ used.

In the second half of the book relating to 1920 to 1938 Mr. Stone discusses and attempts econometric analyses on the data provided, estimating direct and cross-elasticities of demand, but obtaining income elasticities independently by analysis of budget data relating to the years 1937-9, thus reducing the number of parameters to be found from data limited to 19 sets of observations. In the analyses a residual trend is allowed for, to take care of the non-economic factors which are called tastes and habits, and in the long run it " seems to be these factors rather than incomes and prices that determine the level of demand ".

Mr. Stone had to decide which of the two major methods he would use in estimating market demand, that of Henry Schultz using a single equation or that developed more recently, largely at the Cowles Commission for Research in Economics, which reasonably assumes demand cannot be considered in isolation and uses a system of equations even when a solution is required only to the demand equation. The single equation approach, used by Mr. Stone in his paper to the Royal Statistical Society in 1945, is again used, largely because the standard error of this method tends to be lower than that of the simultaneous equation approach. The correlations in economics are so uncertain and little understood that one feels that the direct approach of the single regression equation is more likely to yield results than the simultaneous equation approach which ultimately resolves into the solution of a number of regression equations which seem to have no direct relationship with demand.

In the simplest case of the simultaneous equation approach two equations are used, those relating to demand and supply respectively. Both quantities supplied and demanded are functions of price and further parameters must be introduced to identify the equations ; the demand equation being obtainable if a factor which influences supply only, say the weather, is introduced :

Demand equation $x=ay$ when x is quantity and y is price.
Supply equation $x=by+cz$ when z is rainfall.

The measurements are made from their respective means and usually taken as logarithms so that the co-efficients a, b, and c, become elasticities. From the above equations we obtain :

$$y = \frac{c}{a-b} z \text{ and } x = \frac{a\,c}{a-b} z$$

and these two equations are solved by least squares to give both price and quantity as functions of the rainfall and to obtain therefrom, indirectly, the demand equation required in which quantity is a function of price. If the demand equation were made more complex by adding further prices or terms to allow for changing tastes, then further equations must be added to the system and further factors, like the weather, which influence the system, are not influenced by it, and do not appear in the demand equation, to the other equations. The method becomes very indirect and one is interested to note that Mr. Stone finds its results uncertain even though its arguments appear logical.

These volumes of studies in the national income and expenditure of the United Kingdom reveal something of the immense amount of work that has been undertaken to give us further understanding of the developments prior to 1938 in the United Kingdom along the lines which have been officially given since in the annual white papers and/or blue books on national income. But the work does more than the official estimates, it shows us from the comprehensive figures an analysis of human reaction to those developments.

H. S. Booker.

The Present As History : Essays and Reviews on Capitalism and Socialism. By Paul M. Sweezy. Monthly Review Press, New York. 1953. viii + 376 pp. $5.

This is a collection of essays and reviews written between roughly 1937 and 1952, and covering a wide range of subjects. Part I is entitled " The Character of Our Epoch " and takes in the Communist Manifesto, Toynbee, James Burnham, and the Marshall Plan. Parts II, III and IV take their titles and themes from the two main " 'isms " in the Marxist drama, " Capital- " and " Imperial- ", and deal mainly with problems of the American economy and the German polity. Readers of Economica will be especially interested in Part V on " Thinkers and Theories " which begins with Dr. Sweezy's deservedly well known essay on Keynes, which is followed by a warm eulogy of Pigou's lectures on " Socialism versus Capitalism " and by other criticisms, often appreciative and always stimulating, of Hansen, Schumpeter, Hayek, Luxemburg and Veblen. The final section (VI) deals with some conundrums of socialist economic theory.

Dr. Sweezy is one of the last in the world of a type of thinker of whom there were a number of distinguished examples, especially in Central Europe, about half a century ago (e.g. Kautsky, Luxemburg, Bauer, Hilferding and even Bukharin) but which is now, for several obvious reasons, almost completely extinct, except perhaps at one or two secluded academic spots in the West: we mean the type of thinker who was a thoroughgoing Marxist but who, whatever his delusions and errors, nevertheless thought pretty hard for himself, had something original to say, and was in a position, both legally and intellectually, to learn from and value freely and independently the best *bourgeois* thought. It is very difficult to understand how Dr. Sweezy manages to keep going the attitude or combination of attitudes one finds in these pages. One has the impression that his clock stopped, politically speaking, in about 1936–37 at the latest.

On the one hand, Dr. Sweezy is so thoroughgoing in his Marxism that (in a criticism of Professor K. R. Popper) he lays it down that Marxism is " a valid social science " which yields one valid knowledge of society's " *real interests* " (p. 337). Another and different sort of aspect of the thoroughness of Dr. Sweezy's Marxism may perhaps be discerned from his seeing fit to prefix one of his essays on value and planning with an editorial note in which he gratuitously reformulates the wording of one of his propositions in order to bring it " entirely in accord with Stalin's view " (p. 352). On the other hand, Dr. Sweezy writes penetrating and distinguished appreciations and interpretations of the works of Schumpeter, Keynes and Pigou. The tortuous problem remains as to why anyone who is free and competent to think and write for himself about economists such as these, should care a hoot as to whether or not anything he writes is " entirely in accord with Stalin's view ".

T. W. HUTCHISON.

Sir William Petty. By E. STRAUSS. The Bodley Head. 1954. 260 pp. 25s.

Mr. Strauss divides his book on Petty into three parts, headed Endeavour, Frustration, and Achievement. The first part, which does not add very much to Fitzmaurice's *Life*, gives an account of Petty's early adventures as (among many other things) cabin-boy, hawker, medical student and professor, until his crucial appointment as physician to the army in Ireland in 1652, followed by his great undertaking of the " Down " Survey in 1655–6. Petty was one of the great economist fortune-builders,—like Cantillon, Ricardo, Juglar and Keynes—and it was in these years in his early thirties, amid the chaotic scramble in Ireland under the Commonwealth, that he acquired his immense possessions in land. Throughout his subsequent life a vast amount of Petty's time and energy was to be spent in defending these possessions through endless litigation, and in arduous attempts to develop his properties.

Hence the title of Mr. Strauss's second part, Frustration ; another subsequent source of which was Petty's failure to gain the high political or administrative office which he wanted, which his extraordinary genius seemed to entitle him to, and which would have enabled him to put into practice his teeming, multifarious ideas on shipbuilding, economic policy, religious toleration and many other subjects. Petty seems to have been too clever, too tactless, too argumentative, and too impatient to succeed in politics, and though the king admired him, Petty never obtained a suitable post in public life after the Restoration.

There remains, thirdly, Petty's Achievement, that is, mainly and permanently his writings on demography and political economy, which, Mr. Strauss guesses, might not have been written had Petty achieved the high office he was after; but which, on the other hand, he would have had much more time for had he not got bogged down in his immense Irish possessions. In his concluding chapters Mr. Strauss gives a useful account of Petty's economic ideas. He has not looked into the quantity of unpublished Petty documents, but by setting Petty's writings against the background of his life and times, Mr. Strauss helps us to understand better the ideas of the most extraordinarily versatile genius who has ever contributed to economics.

T. W. HUTCHISON.

A Select Collection of Early English Tracts on Commerce. Edited by J. R. MCCULLOCH. Reprinted for the Economic History Society. Cambridge University Press. 1954. xv + 663 pp. 35s.

This volume is a photographic reprint of one edited by McCulloch for the Political Economy Club in 1856. McCulloch was really the first British historian of economic thought, and all interested in this subject are deeply indebted to him for his pioneer editorial and bibliographical work. Unfortunately, he started the study of *Dogmengeschichte* with a rather narrow blinkered and dogmatic slant from which it does not seem always completely to have recovered—except, that is, when it suffers from the opposite slant deriving from that other classical pioneer of the subject, Karl Marx. The 17th century tracts on the balance of trade by Mun and others are uneven in merit, but McCulloch, in his Introduction, seems to see nothing in them but odd specimens of intellectual pathology. He draws a black and white contrast between these earlier pamphlets and Sir Dudley North's *Discourse*, and the *Considerations on the East India Trade.* Dudley North, first apparently discovered by James Mill, is " an Achilles without a heel " and is praised by McCulloch because " he exposes the folly of thinking that any trade advantageous to the merchant can be injurious to the public " (p. xiii). The author of the *Considerations on the East India Trade* (1701) is praised for his masterly demonstration of the principle " that it is to the public advantage to buy whatever may be wanted in the cheapest markets ", a principle which, McCulloch holds, " can never be departed from without loss and injury to the public " (p. xiv).

McCulloch's Introduction is really rather more, or certainly not less, of an historical intellectual oddity than the two-hundred-years-older pamphlets which he was editing. McCulloch explains the omission of Sir Josiah Child's work on the grounds that it had been reprinted in 1751, and he quotes Macaulay's description of Davenant's tracts as " contemptible ". These grounds do not now seem entirely persuasive, and we hope that McCulloch's valuable selection will be followed by reprints of the works of Child, Davenant and all the other distinguished pre-Smithian economists.

T. W. HUTCHISON.

Income Stabilization for a Developing Democracy: A Study of the Politics and Economics of High Employment without Inflation. Edited by MAX F. MILLIKAN. New Haven : Yale University Press. London: Geoffrey Cumberlege. 1953. 730 pp. $5.

The distinguished contributors to this substantial volume wrote and rewrote their pieces between 1949 and 1953. During this process, the " income stabilisation " which was their subject altered from income creation to inflation control, and was on its way back again by the time the editor finished his introduction. The fifteen writers apparently decided to concentrate on raising income, rather than on reducing demand; in discussing this in a semi-technical manner they succeed surprisingly well in dividing the labour among themselves. Two important subjects do, however, fall by the wayside: international trade influences on domestic stability, and the place of agriculture in a stabilisation programme. The first omission is more excusable in the American context than it would be elsewhere; but in both omitted fields there are forces sufficient to wreck an otherwise satisfactory set of policies.

The editor clearly perceives that " high employment " is merely an addition to the traditional aims of economic policy. It must take its place alongside other full-employment aims of a democratic society, which he believes include: the " ideal " employment of factors; the principle of consumer allocation primarily through a private (competitive) market; an optimum provision for the future; maximum technical efficiency; optimum income distribution; and an optimum level of government expenditure. A large number of subsequent pages are occupied by suggested ways of accomplishing these aims under a full-employment regime. Indeed, many of the authors seem seriously perturbed about the meaning of " allocating resources efficiently " when resources have become underemployed. Is there any point in concerning ourselves with the distribution of income in a depression ? Why not restore full employment and then consider the redistribution of the larger income ?

First, though, the editor steps aside to let Professor Coker demonstrate that intervention by the state for suitable economic purposes is not outside the American tradition. Then he returns to lead the reader briskly through fifty pages of national income measurement and determinants, winding up with brief allusions to price policies and monetary theory. This concludes part I.

In Parts II and III the economists go to work. E. E. Hagen discusses the difficulties of forecasting the need for stabilisation, not the least of which is that a faulty forecast may inspire " correctives " which plunge the economy into the opposite extreme from the forecast danger. Gerhard Colm then outlines the complexities of budget-making in Washington if income stability should take its place among the other objectives of the government. Carl Shoup presents a technical discussion of the effect of altering the various taxes in the American armoury. After a searching examination he asks, if a lowering of taxes is deemed desirable to promote economic recovery, how far should they be lowered ? If half-way, why not all the way, if recovery would thus be speeded ? Like the answer to several other questions raised in this essay, the solution lies in the largely unexplored field of optimum resource allocation during depression. Shoup's essay starts hares enough for a hundred theses.

In the next paper A. G. Hart discusses monetary policy. He discounts monetary routes to full employment, but recommends interest-rate policy as a full-employment stabiliser. He further suggests that potentially useful devices such as the Graham commodity-reserve-currency could not be used, today, if needed, chiefly because they have not been sufficiently worked out to permit their being drafted into legislation. R. S. Brown, Jr. discusses techniques for influencing private investment (by taxation and credit changes); Eugene Rostow the problem of assuring competition under full employment; C. E. Lindblom the complexities of wage repercussions; and three other writers respectively the politics, administration (and co-ordination) and sociology of stabilisation policy. The author of the last, Professor Lasswell, includes a list of common-sense maxims for advisers: " Avoid flat statements about the future ", " Do not appear to hedge by multiplying qualifications "; and on another page presents the Council of Economic Advisers with the ominous warning, " Prevent the formation of dangerous crowds ".

I should like to devote the remaining space to two contributions which refer the problem of stabilisation policy back to the editor's list of aims cited at the beginning of this review. Professor Samuelson states again his opposition to the Friedman-C.E.D. position that there is no case for increasing public works as an anti-depression measure in preference to reducing taxes. Taking the position that a depression presumably occurs because private spending motives have diminished, he concludes that the optimum allocation of resources (and their full employment) indicates an increase in the *public* use of the liberated resources. This brings us to the question whether individual decisions about saving are useful indicators of the optimum allocation of resources among periods. He decides that because " there are no invariant indifference curves over time " the case for respecting a free market decision about the rate of capital formation (as opposed to consumer spending) is not as strong as that for respecting a market decision about the allocation of resources among current uses. Hence, if it is decided that an anti-depression campaign requires increased public spending, there is no dependable *market* guide to whether that spending should take the form of ephemeral public consumption, or durable public works. Professor Samuelson accepts neither Professor Lerner's dictum that the rate of private accumulation should indicate the total rate of capital formation, nor Professor Meade's opposing preference for F. P. Ramsey's non-market optimum rate of investment. (See the *Economic Journal*, April 1945.)

Professors Dahl and Lindblom discuss how to alter the rates of various kinds of public expenditure. Their discussion also involves a fundamental decision about who shall make the expenditure decisions: the choice here lying between the central government and the local authorities. Taking the bull by the horns, these writers, admitting that grants-in-aid may lead to a decline in standards of local government, assert that this loss of authority may occur only because local citizens, having no faith in the efficiency or competence of their local officials, prefer it so. They claim that ratepayers welcome the higher standards and the participation of competent central governments. Hence they advocate a changed American grant policy—unconditional grants for ordinary local government expenditure on a kill or cure basis. If kill, the spending programme will henceforward lie effectively in the control of the central authorities. But if cure, the injection of new revenue sources will revive local government institutions to importance as significant elements in the structure of government. In the latter event the criterion of consumer allocation of resources to desired public uses (by local decision rather than national) comes much closer to realisation. The problem of securing *rapid* increased public spending is intensified when the spenders are at the local level; but the problem of *rational* public spending is greatly reduced. Since this is one of the chief references to the federal dilemma in the book it may be suggested that the problem of which level of government is to do the spending is not squarely faced by many of the authors; the current experience of high federal *defence* expenditure leads them to forget that in depression the burden of planning public works and welfare outlays devolves heavily on state and city government.

In such a short review no justice can be done to such a long and diversified work. The essays abound in stimulating suggestions, though such cross-referencing as the editor has achieved gives the work the appearance of more unanimity than perhaps the authors would confess to. As a guide to current American controversy the work is indispensable. Few works on economic policy have considered so thoroughly *all* the implications of internal financial policy.

A. D. Scott.

Progressive Taxation: A Study of the Progressive Principle in the British Income Tax. By F. Shehab. Clarendon Press, Oxford. 1953. vii+299 pp. 27s. 6d.

The progressive principle in the British Income Tax is a product of certain ideas about distribution which began to find expression in the 18th and 19th century. When manifested in the form of taxation they resulted in an income tax which exempted incomes below a certain limit, taxed the remainder at rising rates, and treated equal amounts of income differently according as they were earned or unearned.

Dr. Shehab commences his narrative with a description of the tax system of the pre-income tax days of the 17th and 18th centuries. By extensive reference to the published pamphlets and tracts of the period the author prepares us for the introduction of the income tax in the closing years of the 18th century. A good many pamphleteers advocated the tax as a war measure but only a few persons of advanced opinions and opponents of the growth of debt sought to justify it as a permanent part of the tax structure. Even as a temporary measure it posed equity considerations and these were reflected in the exemption limit excluding the lowest income groups from the levy. The author's restricted terms of reference prevent him from considering the administrative difficulties in fixing the lower limit. The opposition to the tax launched an attack on its inquisitorial nature but few questioned, on administrative grounds, the utility of exempting the smallest incomes. The tax was designed rather to exempt those who could not pay but, more often, failed to collect from those who would not pay.

The introduction, in 1803, of tax schedules which returned income from different sources and assessed them differently with allowances for dependants was the first step in the development of a system of differential taxation. The source of income was identified and, taken in conjunction with the exemption limit, it offered the opportunity to discriminate by size of income and by source. The schedules were designed as a means of implementing a neutral tax policy by a system of allowances on gross incomes which would result in net incomes of equal amounts being taxed at the same rates. The additional information furnished in the returns, as to source of income, offered a basis for the assessment of higher taxes on unearned incomes, however, and advocates of differentiation lost no opportunity in demanding a reconstruction of the tax. Only the repeal of the tax at the close of the Napoleonic wars stemmed this demand for revision.

The revival of the income tax by Peel in 1842 gave voice to new controversies as to method of assessment and mode of treatment of incomes from different sources. The demands for the exemption of savings and the undeniable claims of low incomes, whether earned or unearned, complicated by the questions of the treatment of large earned incomes was not settled in the 19th century. Two select committees took evidence within 10 years on questions relating to the exemption of savings, graduation and differentiation of the tax, but the question of differentiation was not settled until the Finance Act of 1907 and graduation two years later.

Dr. Shehab's analysis of the literature of the inter-committee years and the report of the Select Committee of 1906 which recommended consideration of size as well as source for tax purposes, is a useful summary of the developments and the findings of the investigators. He shows how the exigencies of war finance in World War I resulted in an income tax of a progressive nature but one which lacked any "intelligent distributional formula" and the anomalies of which demanded correction. The result was the appointment of the Royal Commission of 1919 whose findings incorporated in the tax of the following year approved graduation and differentiation, raised the limit of exemption, and increased family and personal allowances, thus meeting the majority of the demands of the tax reformers of the previous century.

This book is a well written and useful one. It surveys a mass of material and on the whole summarises it well and draws legitimate conclusions. The argument for the taxation of life annuities is perhaps overstated. In criticism of proposals to exempt savings from taxation, Shehab argues that life annuities are a form of investment which do not deserve preferential treatment on the grounds that the life annuitant by investing his money in this form shows his intention to consume his income and that in this form it loses the quality of savings. Surely, if the intention is to exempt savings, to demonstrate that the annuitant intends to consume these savings later does not establish a case for taxing them. The immediate effect is to induce a person with a given amount of capital to defer its expenditure over his lifetime, and in so doing to increase savings. After all, he could spend it all at once.

The heavy reliance on the published pamphlet material and the Select Committee and Royal Commission Reports and evidence are in themselves unobjectionable. These are in themselves excellent sources and the findings and evidence are well summarised. It is surprising, however, to find no references to the Gladstone, Peel, Chatham and many other correspondences and private papers available to the public. Mr. Hubbard's papers appear to be the only exception. In more than one place, Mr. W. E. Willan, co-author of *The Taxation of Capital*, is given as W. E. William. There is, as well, some evidence of inadequate documentation in a number of comments and criticisms of testimony offered before various committees which the author holds in common with critics of the time.

LEROY DUNN.

The Determination of Production. By BURGESS CAMERON. Cambridge University Press. 1954. xv + 101 pp. 18s.

To demonstrate to students of economics, rather than learned professors, how equilibrium quantities and prices may be determined from explicit models of production (and consumption) is a task which has proved very difficult. It is in effect the task of presenting "activity" analysis in simple terms. Mr. Cameron's attempt to furnish an elementary text in this field should be welcomed as a contribution to what is still pioneering work. Those wishing to learn how to use this new and exceedingly helpful tool will get some assistance from Chapters 1, 9 and 12 of Mr. Cameron's book. These chapters give several numerical examples of the way in which equilibrium quantities and prices may be determined from a system of simultaneous equations expressing production and consumption activities, together with data on resources and maximising conditions. The exposition seems to the present reviewer to suffer from two main weaknesses. First, the process of distinguishing efficient production arrangements from inefficient ones is not brought out clearly enough; the single page making up Chapter 10, "Alternative Methods of Production," is definitely misleading. Second, the author slurs over the fact that the art of the method lies largely in knowing how to select, by trial and error or where possible by short-cut devices, the relevant set of equations out of many simultaneous equations (or inequalities).

This kind of analysis can indeed, as Mr. Cameron says, be very effectively used over a wide field of economic theory—it can be applied to problems of location, taxation, investment, certain monetary problems and other aspects of dynamic systems. However, except in the case of location the author does not show the reader how the new tool can be applied to these topics. In introducing them he reverts rather to traditional exposition, giving very short summaries of familiar textbook economics. Thus Chapters 3 to 6 and Chapter 8, together with the two notes and appendices, are of little interest to readers concerned with activity analysis.

H. MAKOWER.

Social Security in the British Commonwealth. By RONALD MENDELSOHN. Athlone Press (University of London). 1954. xv + 391 pp. 35s.

This is an interesting and useful comparative account of social security measures, written by an Australian Government official who spent two years in London between 1948 and 1950. The scope of the book is both a bit wider and a bit narrower than the title alone might suggest. Only four members of the Commonwealth are included—Great Britain, Canada, Australia and New Zealand; but in addition to factual accounts of the various schemes the author discusses such general topics as the administrative problems involved and the place of social security in a national economy.

The accounts of the four schemes follow a uniform pattern—an historical introduction, followed by a description of the system itself and ending with "the issues that have emerged" (or "have arisen", though the change of phrase seems to be no more than an ornate alias). The history follows well worn lines; in the case of Great Britain, for example, those marked out by the Webbs. None the less it is well to be reminded of them. The descriptions of the schemes are neatly done, with sufficient but not overwhelming detail. The issues are clearly labelled. The wider scope of the British scheme when compared with the relatively embryonic developments in the three other countries is clearly marked and has obviously roused the author's enthusiasm. Indeed this enthusiasm occasionally lands him into errors, or at least obscurities. The statement (p. 206) that for unemployment "Britain gives a complete cover" is contradicted by the chart on the previous page in which British cover is marked "partial". On p. 206 also he states that "Benefit can be obtained in every case of need in Britain whether or not contributions have been paid"; this is hardly accurate if, as appears from the context, "benefit" does not include "National Assistance supplements". A footnote on p. 303 suggests that protection against industrial injuries is free of contributions. Table 6 needs checking. But these are relatively minor matters and over the whole the lucidity of his account is to be commended.

On the general topics discussed the author's treatment, though ranging widely, may be said to be stimulating rather than complete—though no less useful for that. In his opening chapter he makes a valiant but not fully convincing attempt to establish conceptual distinctions between " social insurance ", " social assistance " and " social security ". Even his style seems to be a bit daunted by the task and moves less easily than in his later chapters. But he recovers the ground later on in a final suggestion that social insurance and social assistance are now so moving and merging into each other as to be becoming a pair of social Siamese Twins that defy dissection. There is a short chapter on Voluntary Agencies which is all right as far as it goes but does not go very far ; but the problem is fairly stated. His discussion of social security and national economy is almost entirely in *a priori* terms —various possible effects and impacts of social security systems are suggested but there is not much attempt to strike a balance, still less to estimate their effects. The work of A. T. Peacock and others has shown what an intractable job this is and no blame should be attached to the author for not extending his comparisons into this field.

But one does feel occasionally that some of the points might be pressed further—he asks many questions but rarely stays for an answer. On the vexed question of the means test—which emerges from this study as a crucial test of the nature of systems—he fails to hold his argument together. The means test cannot be dismissed by saying (p. 291) that it " has no offsetting good effects, except that it helps to spread a limited amount of benefit to the best advantage ". If demands for social security are to increase, as the author anticipates, and if the amount to be expended is to be limited, as he suggests, to 5–7·5 per cent. of national income—what then ? Nor does he push to a conclusion his discussion of the relation between the contributory principle and administrative complexity—though the line of his thought seems clear. Perhaps this discussion might have been more fruitful if he had distinguished between flat and proportionate contributions and not assumed, as I think he does, that social security always implies contributions also from the general revenue of the state.

But I would not wish to end on a sour note. This is an excellent book. The descriptions are not at all " dull " (as the author apprehends in his preface) and when he lets himself go on the various aspects of the subject he is lively and provocative of thought.

E. M. HUGH-JONES.

William Thompson (1775–1833). By RICHARD K. P. PANKHURST. Watts & Co. 1954. xi + 228 pp. 15s.

Detailed studies of the early nineteenth-century socialists are long overdue. Mr. Pankhurst's short but uncritical account of William Thompson is a useful addition to the existing literature. Thompson's theory of exploitation and his powerful denunciation of the competitive system forecast the " vaster, subtler and more detailed " economics of Marx; it is possible too (though not proven) that his *Inquiry* and *Appeal* influenced John Stuart Mill. At a different level, his doctrines helped to shape working-class politics, even though the

Society for the Diffusion of Useful Knowledge exclaimed that his views, while " harmless as abstract propositions " would end in " maddening passion, drunken frenzy, unappeasable tumult, plunder, fire and blood ".

Mr. Pankhurst keeps very close to the text of Thompson's writings and very rarely attempts to subject them to critical assessment. Merely to state highly abstract theses is not to prove them, nor is a recognition of their place in socialist history identical with an acceptance of their substance. To take one example of Mr. Pankhurst's unwillingness to judge, after remarking that Thompson was one of the first social critics " to emphasize that the trade cycle was an inevitable malady of capitalism ", he makes no attempt to examine the adequacy of Thompson's theory even in relation to the economics of his times.

At many points in this book there is serious over-simplification of social movements and philosophies, particularly " the political economy of the *laisser-faire* economists " and the socialism of the Chartists. The reader can get most value out of this book if he reads the biographical introduction, selects from the text the quotations from Thompson (including the fascinating quotations about the emancipation of women), and then draws his own conclusions. Used in such a way, the book is both of interest and importance.

ASA BRIGGS.

British Economic Statistics. By C. F. CARTER and A. D. ROY. Cambridge University Press. 1954. vii + 187 pp. 21s.

Although the idea of statistical investigation has long been associated with economics, only recently has serious attention been paid to the problem of quality in economic observations—a development largely attributable to the need of a reliable statistical basis for decision-making in the expanding sphere of government activity. Awareness of the problem has been sharpened by developments in other fields of statistics, where it is explicitly recognised that schemes of observation cannot be divorced from the questions being asked and the decisions to be made. This report gives a critical review of British economic statistics in relation to their use for policy-making, based mainly on the criteria of design—i.e. the relevance of existing statistics to policy decisions—and reliability. As such, it is an important pioneering study. Of its quality, the authors and their panel of advisers provide sufficient guarantee.

The book owes much of its effectiveness to the arrangement of the case-studies of economic statistics which form its core. Through them, the discussion is developed from the (relatively) straightforward problem of statistical requirements for housing policy, to the complicated problem of building up a system of social accounts to meet the requirements of general planning. The authors do not expect perfection in economic statistics, of course, but they show clearly a number of areas in which present statistics and statistical arrangements could be improved. In particular, they make a strong case for the suggestion that published statistics should be accompanied both by measures of reliability, and by full descriptions of how they are obtained.

This book can be recommended strongly to all who are interested in economic statistics, not least to university teachers, who will find it an excellent basis for a critical course on statistical sources.

H. C. MACKENZIE.

Realms of Silver: One Hundred Years of Banking in the East. By Sir Compton Mackenzie. Routledge & Kegan Paul. 1954. xiv + 338 pp. 25s.

The Exchange Banks have done much to develop Far Eastern trade, but their work has hitherto been largely unexplored. This centenary history of the Chartered Bank of India, Australia, and China will therefore be greeted with considerable interest. Its 24 chapters have five main themes: the struggles of the promoters; the establishment of the early branches; the crisis with which the depreciation of silver threatened the Bank no less than the " realms " in which it operated; the unstable economic conditions and strong competition from other banks that followed the 1914–18 war; and, finally, the trials of the recent war and post-war period.

This is a " house history ", which is not to say that it is an economic history of Far Eastern trade or of exchange banking. None the less, Sir Compton Mackenzie has tried to combine the institutional with the general; he is most successful in the earlier decades, when the two aspects readily blend. He is naturally happiest in narrative. Deft sketches of local economies provide a succession of backcloths for the emergence of specialised banking techniques. The continuing adaptability of the Bank—or, more precisely, of its officials on the spot—to unfamiliar conditions is here revealed as its greatest asset. If the Bank was not always as thrusting in some areas as it might have been, the reason was often exactly that which helped its steady growth elsewhere: to the first exchange bank in a given area accrued a high degree of monopoly, which newcomers found it hard to break. With growth came changing functions: we see " The Chartered " (to use its familiar name) moving from peripheral activities—the finance of trade—to the finance of internal development.

This is a good story, well told, yet it could have been told better without losing the appeal which a house history presumably seeks to make. Some comments have surely strayed from Sir Compton's page in a well known weekly (e.g. that on war-time Britain on p. 286). Upon some matters, discussion is inadequate. Two stand out. First, the incidence of economic fluctuation, though of evident importance to the young bank's very survival, is nowhere analysed systematically. Second, the technical treatment is curiously uneven. Sir Compton wisely does not avoid the intricacies of exchange banking technique; on the contrary. It is disappointing, however, to have his cursory treatment of central banking, and no discussion at all of most problems that stir students of Indian banking. Nor is it very illuminating to hint at the Bank's association with war-time industrialisation in India, but to carry the reader no further. Partition in 1947 is described, but not its effect upon the Bank, with its branches in both new Dominions. In default of discussion, references would help, besides authenticating the book: but footnotes and bibliography are alike absent.

In his preface, the Chief General Manager writes that " The archives of the Bank contain material sufficient for a dozen books, but there is much that cannot yet be told ". Reticence, silence: within such limits, this history of the senior exchange bank is useful as well as readable; but it will be good to learn more from those archives.

L. S. Pressnell.

SHORTER NOTICES

Glyn's 1753-1953—Six Generations in Lombard Street. By ROGER FULFORD. Macmillan. 1953. xvi + 267 pp. 21s.

This is a most readable book, though in places a little gossipy, frequently being more concerned with the families from which the partners of this bank were drawn than with the institution as such, though one does acquire the " feel " of the way in which a private banking house worked. The book also throws new light on behind-the-scenes negotiations during the Baring Crisis, but apart from the all too few quotations from Glyn's own records, the history is mostly at second-hand and as a contribution to the study of banking development it is disappointing. Perhaps the most interesting aspect of this history was the way in which Glyn's effected a compromise between remaining a purely private bank and becoming whole-heartedly joint-stock. Largely due to the nature of this decision, the bank has retained much of its special character and continues to offer its customers a somewhat different type of service from other institutions.

Britain and Industrial Europe, 1750-1870 : Studies in British Influence on the Industrial Revolution in Western Europe. By W. O. HENDERSON. Liverpool University Press. 1954. vii + 255 pp. 25s.

An account of the activities of British engineers, craftsmen and entrepreneurs in bringing the industrial revolution to Continental Europe can easily degenerate into an enumeration of names and establishments. This danger is most successfully avoided in the chapter on Belgium, also in part of the German story ; the book is most interesting wherever one family, like the Cockerills, or one entrepreneur, like W. T. Mulvany, holds the stage for a prolonged period. Dr. Henderson has used and listed much valuable source material, both in English and other languages, which will be of great help to others working in this field. Comparatively few pages contain more than two misprints.

National Income of Nigeria 1950–1951. By A. R. PREST and I. G. STEWART. Colonial Research Studies, No. 11. Her Majesty's Stationery Office. 1953. viii + 123 pp. 8s. 6d.

Pioneer studies of the national income of Colonial territories have demonstrated how difficult it is to apply techniques developed for "Western" countries. This study recognises these difficulties, but it does much more than this. Its discussion of the methods of estimation raises fundamental problems of national accounting such as the usefulness of building a complete set of social accounts for under-developed countries; and this gives the study a much wider interest than its statistical results suggest. But the results themselves are important. The authors show that by any reasonable estimation the income levels of West African territories are much higher than has generally been supposed and that in the case of Nigeria, the *per capita* level of income (£20 p.a.) approaches that of India.

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The Accountant's Contribution to the Trade Cycle

By W. T. Baxter

I

It is well known that changes in the price-level can alter the accountant's figures for cost and profit. A firm's inputs are normally charged in accounts at their acquisition price; and so—unless inputs and sale are simultaneous—the cost side of a revenue account must reflect an earlier price level than the revenue sale. When prices are rising, accounting costs tend to be low relative to replacement costs, and so profit looks large; when prices are falling, accounting cost is relatively high and profit small. Perhaps we may—rather tendentiously—use the phrase " historic cost error " to describe the gap between accounting profit and the profit figure that would be found if inputs were charged at the replacement prices ruling at sale dates. This latter profit may be called " corrected profit ".

The historic cost error has been widely advertised during the post-war inflation, mainly by businessmen who feel their taxes—based on accounting profit—to be unreasonably high. But it has other aspects of importance, and notably its possible influence on the trade cycle.[1] Its alternate over- and under-statement of profits seems likely to affect the size of the cycle—in particular, through its influence on mental attitudes, on the supply of credit, and on policies of consumption and investment.

II

There are accordingly plausible grounds for agreeing with the critics who accuse the accountant of *intensifying* an established upswing and downswing. Little has, however, been said so far about the *timing* of the accounting error. This point seems to demand study—since, if the error's size alters much at times of instability, its impact is likely to be the greater.

A scrutiny of the error's anatomy is necessary for this argument. The error arises if, during a time of changing prices, the date of buying any input precedes the sale date of the resultant output. By far the most important inputs with such a time-lag are plant and materials; and so the accounting costs that are suspect are those under the heads of depreciation and " cost of goods sold ".

The error can in theory be measured easily enough, since it is the difference between the replacement and the historic costs of inputs.

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[1] The trade cycle effects have been explored, in particular, by Mr. K. Lacey—see e.g. his *Profit Measurement and Price Changes* (London, 1952). They are also discussed in G. Haberler: *Prosperity and Depression* (New York, 1952), pp. 49–50, and in Erich Schiff: *Kapitalbildung und Kapitalaufzehrung im Konjunkturverlauf* (Vienna, 1933), pp. 113–34.

Let H be the historic cost, c the reading on an appropriate price index at the date of the input's purchase, and s the reading at sales date. ("Appropriate" obviously evades a lot of questions; but, difficult and relevant though these are in other contexts, they scarcely seem to demand answer for the narrow purpose of our present study.) Then the accounting error is $H(\frac{s}{c}-1)$—i.e. this is the amount by which accounting profit exceeds corrected profit.

III

Let us take depreciation first. Here H is that part of the asset's historic cost which is shown each year as an expense in revenue account —and is, by the straight-line method, a constant quantity in all years of the asset's life; c is the price-index of the asset's acquisition date, and therefore is also a constant throughout the asset's life; and s varies each year, since it represents the price-level at which output is sold during that year, i.e. it is the average of the price-indices at the dates of all sale transactions, weighted by their sizes. The error, $H(\frac{s}{c}-1)$, thus alters in step with the price-level.

It may be helpful to get a rough picture of the error's results through diagrams. In Diagram 1A, we assume that plant is bought at the start of Year 1, when prices have just reached the median level of an imaginary cycle, and the index stands at, say, 100. Their course is then assumed to follow the unbroken curve *AB*. The annual depreciation charge in accounts, being based on original cost, will follow the straight line *CD*. The vertical distance between *AB* and *CD* suggests the error's movements from year to year. When s exceeds 100 (as in the years till the end of 6), historic cost is less than replacement cost—for instance, at the middle of Year 1—by *AC*; accordingly the accounts now understate costs and overstate profit. The error's contribution to the profit figures for each year may perhaps be best shown by the height of the pillars at the foot of the diagram. Those pillars which rise above zero indicate a positive error, i.e. an increase in the accounting profits; such an increase is found during all years with prices above 100. In Years 7 to 12, prices are below 100, and the error becomes negative and depresses low profits still further. The positive and negative errors will—in these improbably symmetrical conditions—exactly cancel over the years.

We can speak of the error's effect on costs with some certainty. However, its size relative to profit must vary from case to case. Depreciation may be large or small compared with profit; thus the error will be negligible where a firm owns little plant, but substantial in e.g. an electric power undertaking. Again, the given firm's profits may not move in proportion to price changes. But perhaps we are not over-simplifying too grossly if we picture corrected profits as following

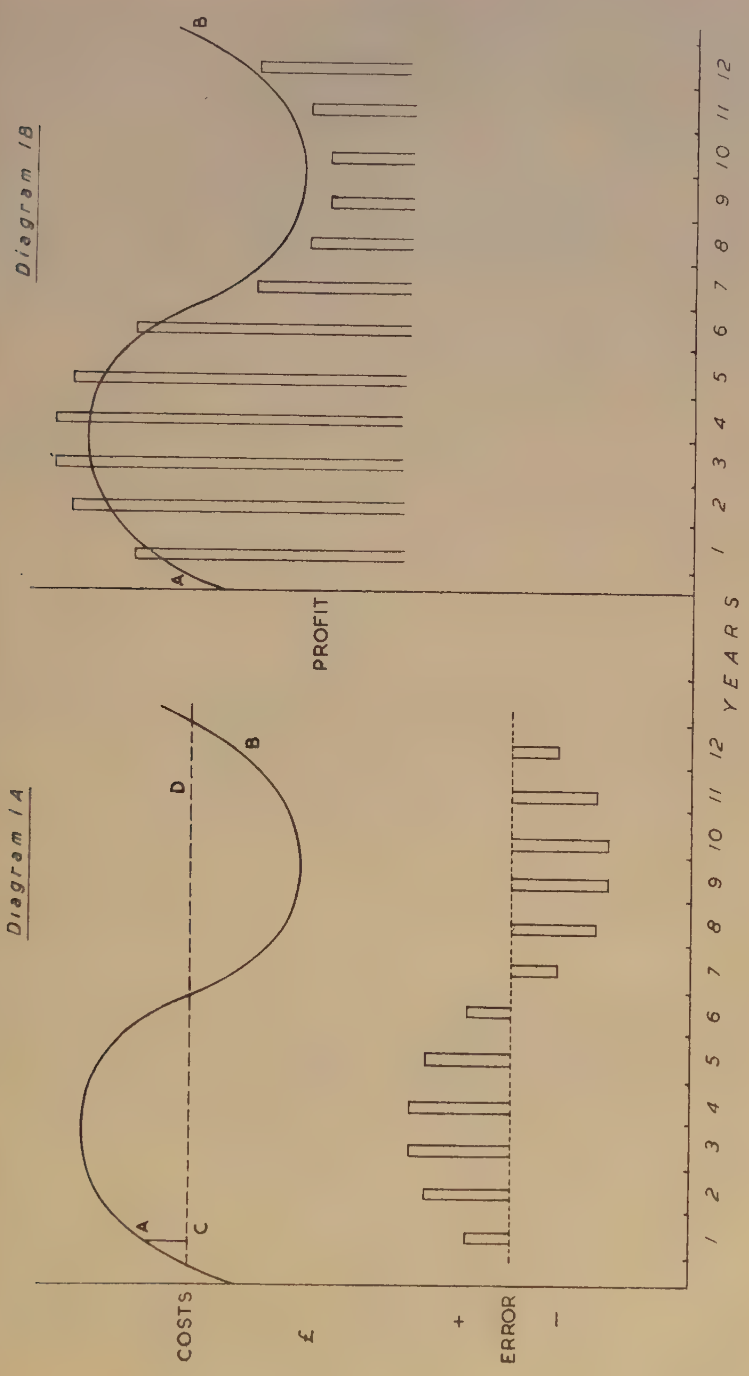
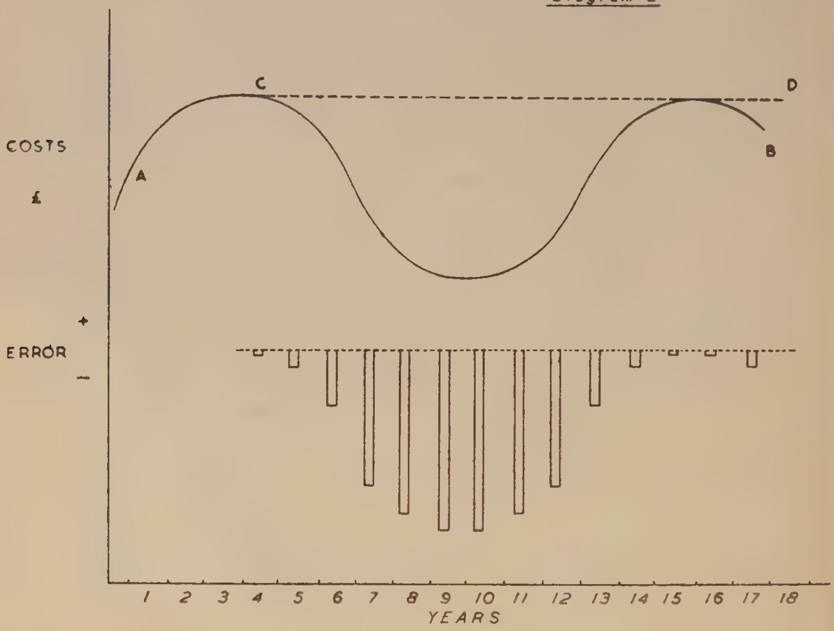


Diagram 1A
Diagram 1B
COSTS
£
+
ERROR
−
PROFIT
YEARS
A
B
C
D
1
2
3
4
5
6
7
8
9
10
11
12

much the same pattern as the price-index. Then the pillars in Diagram 1B represent accounting profits of the various years; were it not for the error, each pillar would rise to the price curve *AB*. The error extends the pillars somewhat in good years, and cuts them short in bad years.[1]

Had the plant not been bought at the mid-point of price movements the error's pattern in Diagram 1A would not be symmetrical about *CD*, and the positive and negative errors would be less likely to cancel over the years. For instance, if the plant is bought at a price peak (as in Diagram 2), *s* will never rise above *c*, the error will always be negative, and accounting profit will in consequence always be less than corrected profit; here the firm sets aside more depreciation funds than will be needed for replacing the plant at anything less than peak prices, and so expands its real capital unwittingly. At the other extreme, where plant is bought at the nadir, accounting profit will tend to be swollen because of the skimpy depreciation policy, and the firm may have to borrow extra funds at replacement day.

Diagram 2



There seems to be a general impression that the error is substantial only when prices are still going up; thus the agitation for tax concessions dies down as soon as a rise in prices is checked. In the case of plant, however, a large error can obviously persist for a long time. For instance, at present (1955) the price increase seems to have been slowed and the curve may now form the contour of a fairly level plateau (perhaps as in Year 9 onwards in Diagram 3). But much of our plant was bought long before the plateau was reached, at prices far below those now current; $\frac{s}{c}$ is therefore still a sizeable quantity, and will continue to be so until the plant has been replaced at plateau prices (when, as in Year 11 of Diagram 3, historic cost *CD* rises abruptly and once more blends with replacement cost *AB*, thus dragging accounting profit down to its correct level). The depreciation error must be substantial in firms with large old plants; the owners of such firms have still as strong a case as ever for tax concessions. A recent estimate suggests that in 1952 replacement cost depreciation was still, for the plant and machinery of manufacturing firms as a whole, *nearly double* historic cost depreciation.[1]

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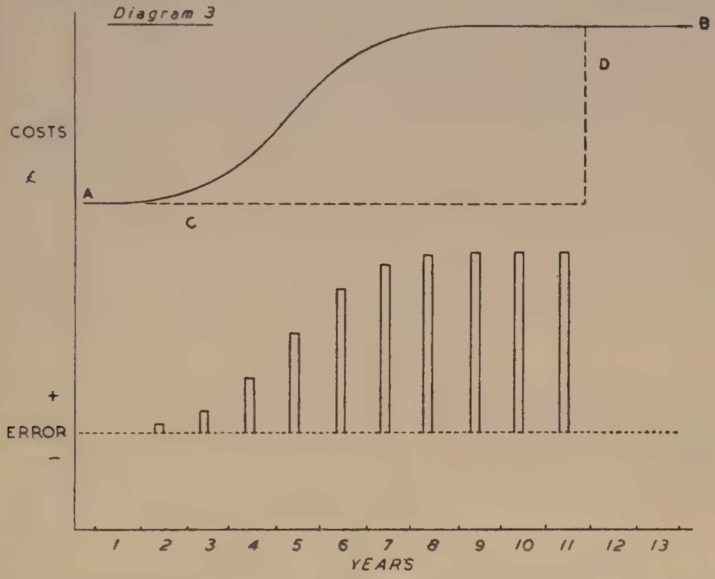
[1] In Diagram 1A, the heights of the pillars show the extent of the error relative to historic depreciation. In 1B, the difference between the pillars and *AB* suggests the extent of the error relative to correct profit. The vertical scales in 1A and 1B are therefore not the same.



We may conclude that movements of the depreciation error will—in timing and pattern—approximately coincide with movements in prices, and perhaps with those in correct profits. Thus the error is likely to serve the cycle as a prompt and often powerful ally by intensifying the prevailing mood.

IV

In any discussion on stocks, one should keep in mind the form of calculation through which stocks alter accounting profit. A merchant's trading account (for, say, a calendar year in a spell of rising prices) is set out somewhat like this:

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[1] Philip Redfern: " Net Investment in Fixed Assets in the United Kingdom, 1928–1953 " (a paper read before the Royal Statistical Society, 19th January, 1955), Table 12.

	£		£
Cost of Goods Sold—		*Sales*—1,000 units	1,456
Opening Stock (400 units) ..	380		
Purchases (1,000 „) ..	1,090		
	1,470		
Less Closing stock (400 units)	460		
Total	1,010		
Gross Profit	446		
	£1,456		£1,456

The important things to note are that closing stock must mainly consist (on the usual "First-In-First-Out" assumptions) of those purchases which were made in the later months of the trading year; and that, by subtracting closing stock at its original cost, we deprive these later purchases of all influence over this year's trading cost and profit. The "cost of goods sold" might be set out more clearly by showing the various blocks of purchases in detail—for example, as under (supposing that extra stocks are built up in the spring to meet a sales peak in the autumn):

	Physical Units		*Average Price*	£	
Cost of Goods Sold—					
Opening stock (bought July–December, last year)		400	·95		380
Purchases:					
January–June (this year) ..	600		1·05	630	
July–December (this year) ..	400		1·15	460	
	1,000			1,090	
Less Closing stock (bought July–December, this year)	400		1·15	460	
		600			630
Total		1,000	1·01		£1,010

Thus the £1,010 charged against the sales of the current accounting year is the cost of purchases made between the preceding July and the current June. (Where the units of stock are not homogeneous, some items will not be sold in strict order, and the figures will overlap a trifle; but the argument is not changed substantially.)

The error is produced by this discrepancy between "cost year" and "revenue year". If the average replacement price—weighted to allow for the pattern of sales over the year—is 1·12, then the error is:

	£
Replacement costs, at average price for January–December, 1,000 units at 1·12	1,120
Historic costs, at actual purchase prices, July–June	1,010
Error	£110

It will be seen that " inventory profit " is scarcely a happy phrase with which to label the error. " Inventory profit " is commonly used to mean the increase in the value of the given physical quantity of stock between opening and closing dates. Here this increase is only £80, whereas the error is £110. If the physical quantity of stock is kept fairly constant at all times throughout the year, inventory profit gives a handy approximation to the error.[1] But many types of stock, even though they may return to the same level at the year's end, have seasonal peaks. Where, for instance, a firm builds up stocks for the Christmas rush, or a country's store of wheat diminishes as harvest recedes, the difference between annual inventories will not exactly equal the error save by coincidence; usually it will be less than the error, since the accounting year tends to end at a time of low stocks. To fall back on the *reductio ad absurdum* method: there could be a substantial error if a firm buys all its goods in the spring and sells out completely in the autumn, and yet its opening and closing stocks (and presumably therefore its " inventory profit ") would be zero.

How does $H(\frac{s}{c} - 1)$ behave when we pass from plant to stocks? For most firms, the annual cost-of-goods-sold is a far bigger figure than depreciation, and so H is normally substantial. s is again the cost index at the weighted average date of the year's sale transactions—say, mid-year. c is the cost index at the weighted average date of the year's purchases of stock. Because stock is normally sold within a few months from its purchase date, the cost of a batch of goods is not likely to be split up and charged against several years (as is the case with the cost of a machine), and so c is here a far more volatile quantity than when it relates to depreciation, and usually follows hard on the heels of s. The stock error may thus have a pattern quite different from the depreciation error.[2]

In Diagram 4, the curve AB represents the current (replacement) cost of goods; it can also represent purchases if physical activity is constant. The curve for historic cost can be got simply by shifting AB to the right, by the space of the turnover period; it is shown as the dotted line CD. The error is due to the vertical distance between the two curves (e.g. in Year 6, EF). The total contribution by the error to each year's accounting profit may again be shown by the heights of

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[1] The stock error can be expanded to $s(B+P-E)-(Bb+Pp-Ee)$ where B, P, and E are respectively the physical quantities of stock-at-beginning, purchases, and stock-at-end; and the average prices at which each of these quantities was bought—at beginning, purchase, replacement, and end—are respectively b, p, s, and e. If stock is kept constant, however, $B=E$. Then the error is $sP-(Bb+Pp-Be)$; whereas inventory profit is $B(e-b)$. Error and inventory profit are equal if $P(s-p)=0$. This condition is satisfied if $s=p$, which is perhaps most likely to be the case where goods are replaced at the same time as they are sold, i.e. where stock is always constant.

[2] The difference would shrink if the life of the machine is short; for instance, where the life is only two years, c tends to catch up with s in a series of biennial hops. Where a range of long-lived machines is being steadily replaced throughout the cycle, c (based on the total cost of all the machines) is very stable.

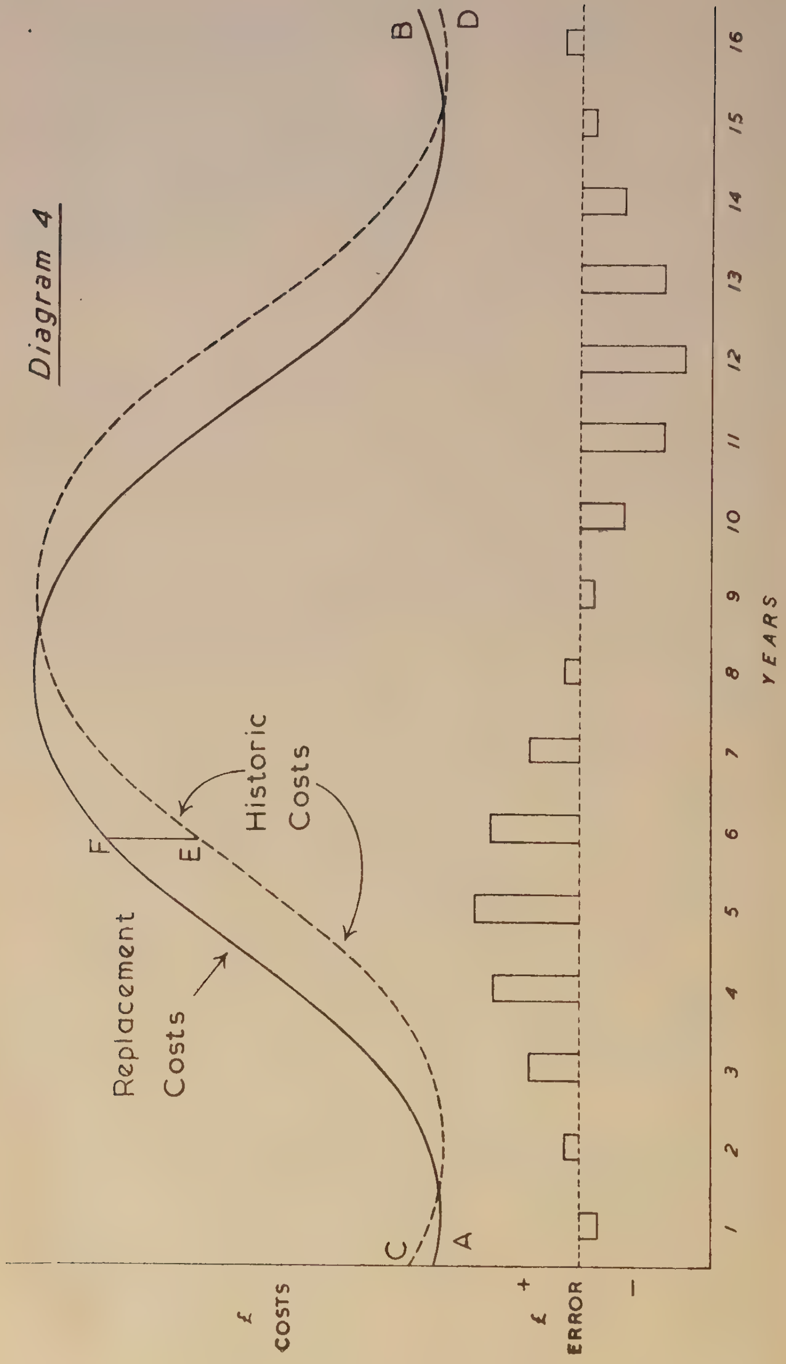

Diagram 4

Replacement Costs
Historic Costs
A
B
C
D
E
F
£ COSTS
£ ERROR
+
−
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
YEARS

the pillars at the foot of the diagram. In years of rising prices, $H(\frac{s}{c}-1)$ is positive and so the error restrains accounting cost and thereby lifts accounting profit. If prices stop rising, the error shrinks to *nil* in a time not longer than the turnover period (as in the months about the end of Year 8). On the down-grade, the error is negative.

The stock error can move from its positive to its negative extremes either slowly or abruptly, according to the shape of the price curve. (With the depreciation error, this transition lasts from peak to trough.) Our curve in Diagram 4 rises at its fastest in Year 5, thereafter rises at a decelerating pace, and culminates in a gently rounded peak; corresponding movements take place on the down-grade. With such a "sine-shaped" curve, the error's upward trend is reversed (in Year 6) well before the peak is reached, at the point where *AB* and *CD* cease to run parallel and start to converge; and the new trend lasts till the curves are once more parallel (Year 12). When the price curve has a less rounded peak and trough than in our example, the error's trend will change more steeply. In extreme cases, where the curve culminates in a sharply pointed peak (i.e. where *AB* and *CD* are triangular or cusp-shaped) the transition from positive to negative is violent, and its damaging impact is concentrated on the period just after the peak; similarly a pointed trough may herald a sudden improvement in the accounts.

Whether the stock error has noteworthy effects will depend on both the price curve and the methods of the firm in question. The impact on costs is the more likely to be big if any of the following conditions obtain:

(*a*) The price change is violent.
(*b*) The turnover period is long.
(*c*) Material costs form a large part of total costs (as e.g. where the firm deals in commodities).

Yet another condition must obtain before the change in costs is likely to have a dramatic effect on profit trends: the rate of gross profit must be low. Given suitable circumstances, accounting profit might be distorted as in Diagram 5. Here we assume the course of the price-index—shown as the unbroken curve *AB*—and the error to be the same as in Diagram 4; we also assume that corrected profit follows much the same pattern as the price-index. The height of the pillar for, say, Year 6 shows the correct profit for 6 (from the base up to the line *AB*) and then the error (from *AB* upwards—corresponding to the distance *EF* in Diagram 4).

In this particular example, accounting profit starts to wane in Year 7, although the peak in prices and profits is not reached till the middle of 8. The circumstances needed to bring about this premature fall are:

(1) As the summit draws near, prices must rise at a decelerating pace. And

(2) The error must be large relative to profit, so that the decline in the error outweighs the rise in correct profit (see Years 7 and 8).

Condition (1), it seems reasonable to think, will obtain not infrequently. Condition (2) depends on the factors listed in the preceding paragraph; however, even if these are not strong enough to make accounting profit fall, they will certainly damp its upward trend.

On the down-grade of prices, our example reflects the same forces. In Years 14 and 15, the negative error moves so steeply to zero that it raises accounting profit (though the nadir of prices and correct profits is not reached till the mid-point of Year 15)—and this merely because prices are now falling at a decelerating pace. (The dotted lines in Diagram 5 will be explained later.)

If our diagram correctly shows a tendency found in a fairly large number of cases, then surely the error should play a bigger part than it has done hitherto in discussions of the trade cycle. Such changes in the trend of reported profits might well affect business opinion decisively. Just as the " accelerator " is said to alter the demand for capital goods before general activity reaches its turning points—perhaps thereby causing the general crisis or the recovery—so accounting may alter mental attitudes prematurely, and thus contribute to changes in activity.

It is not hard to find flaws in our diagram. In real life, the pattern of profits will doubtless not correspond closely to our curves. One reason is that firms are unlikely to carry constant physical stocks throughout the cycle; if stocks are reduced in the slump, the error will also dwindle at that stage.[1] Another factor that may vary physically is sales; if, as seems likely, these grow in the boom and fall off in the slump, they will probably give a bias to corrected profit; but the error would not seem to be affected thereby (save by any consequential changes in physical stock). Again, selling prices may not be adjusted promptly when general prices change; in particular, they may lag because the firm fixes them at historic cost plus a constant mark-up—a policy likely to cause further changes in customers' demand, and so in physical volume of sales. Thus we cannot—till many empirical studies have been made—treat any abstract diagram as an accurate photo of profit patterns. The case against conventional accounting is not so clear as Diagram 5 suggests.

However, though we cannot say that accounting profit always anticipates the general trend of the cycle, we can hardly avoid the conclusion that accounting cost may have a most unfortunate influence at crucial points in the cycle. Just when confidence begins to waver, delayed high charges for goods find their way into the accounts; the stock error has its least desirable effect at the worst possible moment.

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[1] In general, stocks appear to have a cycle very like the sales cycle, but with a narrower amplitude and a lag of some months (the number of months varying with different types of stock)—M. Abramovitz: *Inventories and Business Cycles* (New York, 1950), pp. 93–6, 144–5.

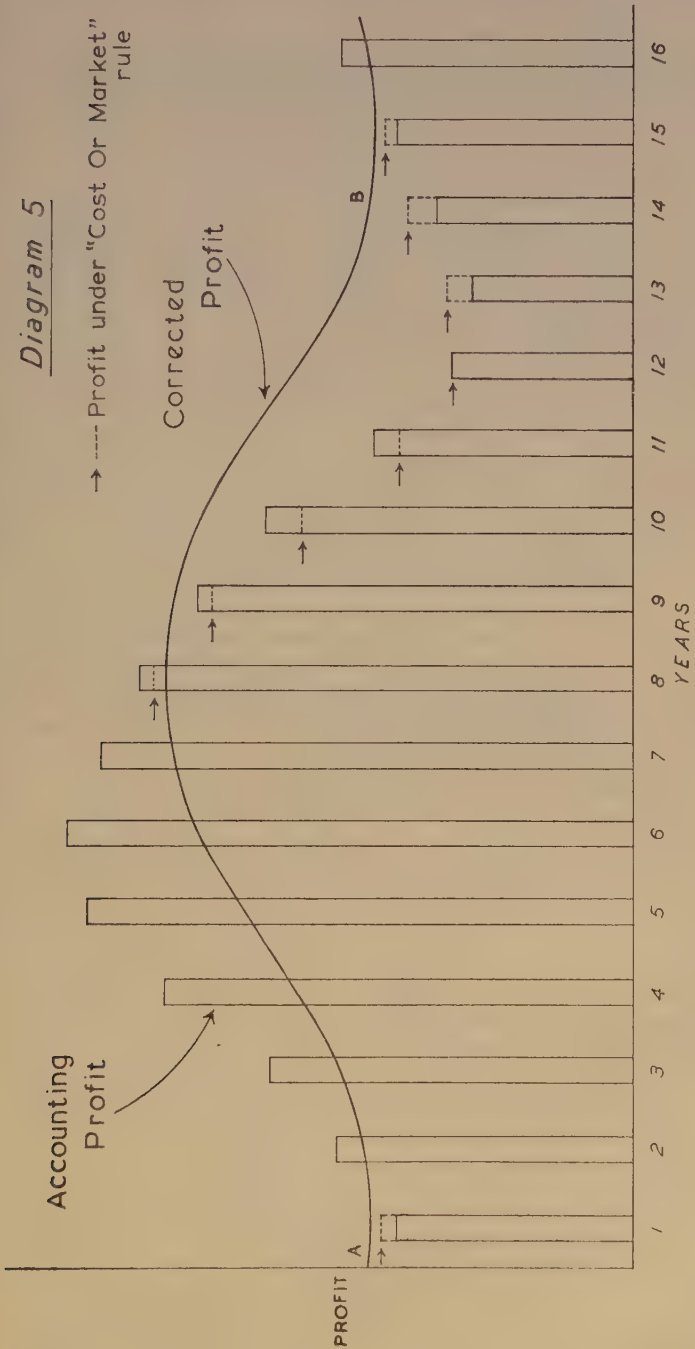

Diagram 5

→ ---- Profit under "Cost Or Market" rule
Corrected Profit
Accounting Profit
A
B
PROFIT
YEARS
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

V

Another practice of accountants may aggravate the stock error's effects at the start of the down-grade. Our discussion has so far supposed that the closing stock figure in revenue account is always valued at historic cost (found on " First-In-First-Out " assumptions), i.e. at the price level of a date preceding the end of the business year (on average, by half the turnover period). In fact, this may well not be true on the down-grade of prices. For then the normal practice of accountants is to abandon historic cost, in accordance with the over-riding rule of " Cost or Market, whichever is the lower ". The precise interpretation of this cautious formula varies from firm to firm; but its general effect must on the down-grade be to depress stock values to below their historic cost. For example, if the business year ends on December 31st and stocks were bought in August, the unsold items will at closing stocktaking be valued at the market prices of December 31st if these are lower than the cost prices of August.

This rule leaves our argument unchanged so far as the up-grade of prices goes. In the first year of falling prices, however, Market is substituted in the revenue account for the (higher) Cost value of closing stock, though opening stock is—somewhat inconsistently—still shown at Cost. Thus a smaller sum is deducted from the charges, and accounting cost is increased; in effect, the cost-of-goods-sold is loaded with both (i) the usual error for the year, and (ii) a bit of next year's error. Profit, under this double assault, may well fall abruptly. In Diagram 5, this decrease is shown by the dotted line cutting off the top of the profit column for Year 8.

In subsequent years of the down-grade, both opening and closing stocks are valued at Market. This pessimism at both ends of revenue account puts a brake on the rule's working. The net effect of the rule seems to be substantially as follows (assuming physical quantity of stock does not change violently, and the price curve is free from kinks). Profit is reduced so long as the replacement cost curve is falling at an accelerating pace (Years 8 to 11 in Diagram 5). If the pace becomes constant—for the space of an accounting year plus the preceding months during which opening stock is bought—profit is the same as if the rule did not exist (Year 12 in Diagram 5). If prices fall at a decelerating pace (Years 13 and 14), the rule actually makes accounting profit less conservative, and so speeds up the illusion of recovery—and perhaps the actual recovery too.[1] In the last year

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[1] Let E and B be the physical quantities of stock-at-end and -at-beginning in a revenue account for Year n. Let c_n and c_{n-1} be the prices at which stock-at-end and -at-beginning are valued at Cost, and m_n and m_{n-1} at Market. Then the inclusion of stocks in a revenue account raises profit by :

If stocks are valued at Cost.............................. $Ec_n - Bc_{n-1}$
If stocks are valued at Market.......................... $Em_n - Bm_{n-1}$
So switching from Cost to Market depresses profit by .... $E(c_n - m_n) - B(c_{n-1} - m_{n-1})$

Suppose that physical stock is constant. Then E and B are equal : therefore the rule depresses profit if $(c_n - m_n)$ exceeds $(c_{n-1} - m_{n-1})$—i.e. if prices are falling of the rule's operation, closing stock reverts to Cost, but opening stock stays at Market and so keeps down the cost-of-goods-sold.

Thus, on the down-grade, the rule's effect is to reinforce the error, and to make accounting profit respond more sensitively to each change in price trends.

VI

There is an important counter-argument to the whole case against the error. When profit rises and falls on paper, tax rises and falls in fact. Thus the elation of good years is damped by stiff extra payments to the Treasury, while poor results bring compensation in the shape of lower imposts.

With tax rates at their present level, this counter-argument should plainly make us pause. However, though it may weaken the case against conventional accounting, it does not seem to destroy it. Various factors lessen the compensating effect of tax. Tax is not usually included in cost calculations; if costs are distorted by the error, tax will not save the management from faulty decisions. Tax is not assessed at 100 per cent.; some part of a profit increase remains to cheer the appropriation account. Moreover, high profits convey a comfortable suggestion (to all save the knowledgeable) of correspondingly high cash resources; and this is rational at least to the extent that high profits make banks more ready with loans. Again, the date at which tax is paid may seem remote—under British tax law, a spurt in profit is unlikely to raise tax payments until a year or more has passed, and so there is a long period before the cash is drained off.

For these or more elusive reasons, tax does not appear to neutralise the error's effects. Everyday observation suggests that, despite tax, high profit figures bring elation and low figures gloom.

Another counter-argument deserves note: firms that make inadequate provision for replacing assets will soon find themselves short of funds, and so their expansionist policies will be pulled up sharp. This argument also merits respect. Many firms did get into a sorry cash position while rebuilding stocks after the war.[1] Once again, however, the counter-effect does not seem strong enough to check the inflationary trend. Probably the firms short of cash can usually manage to borrow (especially as those worst hit by the error will tend *ipso facto* to show the most glowing profits); bankers are not immune from the general optimism.

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at an accelerating pace; the rule raises profit if $(c_n - m_n)$ is less than $(c_{n-1} - m_{n-1})$; and it has no effect when $(c_n - m_n)$ equals $(c_{n-1} - m_{n-1})$.

If E and B are not equal, the pattern is modified. For example, if physical stocks sink during a depression and so E is less than B, the switch from Cost to Market depresses profit less than if stocks are constant; the dotted lines in Diagram 5 become higher in all years. But the modification seems to be slight unless physical stock changes to a remarkable degree.

[1] See the consolidated balance sheets of some 1,500 sample companies dependent on banks, in the British Bankers' Association's *Memorandum to the Royal Commission on Taxation*, 1951.

VII

To sum up. The accountant's devotion to historic data begets cost figures that lag behind prices. In consequence, accounting profits overpaint the state of trade. The depreciation error tends to make the high-price years (both before and after the peak) look better, and the low-price years look worse. The stock error instead lifts profits in all years when prices are rising, and depresses profit throughout the down-grade; it seems likely to exaggerate the rate of change in the trend of correct profit, and may on occasion produce falling profit figures before the price rise has ended, and rising figures before recovery has begun.[1]

It appears reasonable to conclude that an error so widespread and so emphatic in its rhythm must have a considerable influence on business sentiment. In particular, the error is likely to strengthen the factors that link demand and investment (after a time-lag) with the rate of change of prices; it probably introduces a relationship analogous to the accelerator principle. If this argument is correct, the error must reduce the stability of the economy.[2]

Reform of accounting thus seems to offer one of the simplest and safest devices by which we might try to combat instability. Many businessmen have already suggested that the Chancellor should permit the use of replacement costs in computing their firms' taxable profit. By granting this privilege, on condition that replacement costs are also used in the ordinary revenue accounts, widespread reform could be achieved with little opposition from business.

The London School of Economics.

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[1] Where accounts include both depreciating assets and stocks, the errors' *composite* pattern will probably look rather like the pillars in Diagram 4, but the depreciation error will push each pillar somewhat to the right (so that the highest error is nearer to, but still comes before, the price peak); the depreciation error will also give the accounting cost curve a greater amplitude than the replacement cost curve.

[2] See A. W. Phillips: " Stabilisation Policy in a Closed Economy ", *Economic Journal*, June 1954, pp. 311–4, for a mathematical demonstration that, when one component of demand depends on the rate of change of prices, the system is made less stable. The accounting error is presumably one of the reasons for such dependence.

The Transfer Problem: A Note on Criteria for Changes in the Terms of Trade

By Harry G. Johnson

The transfer problem is a perennial problem in the theory of international trade, which has given rise to a voluminous literature. Recently Professor Samuelson has surveyed this literature in an exhaustive investigation of the classical two-country two-goods transfer problem,[1] in the course of which he has derived criteria for determining the direction of change in the transferring country's terms of trade. The purpose of the present note is, first, to demonstrate that Professor Samuelson's criteria may be derived by a simple argument requiring no geometrical or mathematical analysis;[2] second, to raise some doubts about the sharpness of the contrast between Professor Samuelson's terms-of-trade criteria in the cases of " real " and " artificial " obstacles to trade, and to present general criteria which comprise both cases. The argument incidentally provides a new support for the classical presumption that the terms of trade will turn against the transferor, and sheds some light on the influence of transport costs on the problem.

The simplest approach to the transfer problem is to consider the effect of the transfer on the demand for the transferor's export good at constant (pre-transfer) prices. The effect of a transfer will be to decrease the transferor's demand, and increase the transferee's demand, for the transferor's export good.[3] If the net effect is an increase in the quantity of the transferor's good demanded, the transferor's terms of trade will have to turn in its favour to restore trade equilibrium, and vice versa. This result follows from two assumptions of the model: identity of total income and expenditure, from which it follows that (at constant prices) an increase in demand for one commodity is accompanied by a reduction in demand for the other, so that we need only consider the demand for one commodity; and market stability, from which it follows that excess demand for a commodity must be eliminated by an increase in its relative price. Since the relationship between the prices of the same good in the two markets is assumed to remain fixed in each of the cases studied, it does not matter in which market the terms of trade are measured; and since changes in production will depend on changes in the terms of trade, it does not matter whether we assume production in each country fixed or variable.

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[1] P. A. Samuelson, " The Transfer Problem and Transport Costs: the Terms of Trade when Impediments are Absent ", *Economic Journal*, Vol. LXII (June 1952), pp. 278–304 ; *idem*, " The Transfer Problem and Transport Costs, II: Analysis of the Effects of Trade Impediments ", *loc. cit.* Vol. LXIV (June 1954), pp. 264–289.

[2] The argument presented here is an elaboration of the analysis presented by Professor Viner, in his *Studies in the Theory of International Trade* (London: Harper, 1937), pp. 353–56.

[3] On the assumption that neither good is inferior.

Now consider the effects of a transfer of one unit of money income[1] from B, the transferor, to A, the transferee. B's exports to A will increase by some quantity q_{ba}, and B's consumption of its own good will decrease by c_{bb}, where c_{bb} is B's marginal physical propensity to consume its own good. The total effect of the transfer on the demand for B's good is given by $q_{ba}-c_{bb}$; and the terms of trade will turn in B's favour, remain unchanged, or turn against B according to whether this expression is positive, zero, or negative.[2]

In the case of no impediments to trade, the physical quantity of B's good consumed in A is the same as the quantity exported from B; hence $q_{ba}=c_{ba}$ (A's marginal physical propensity to import) and the criterion for the change in the terms of trade is $c_{ba}-c_{bb}$. The movement of the terms of trade depends on which country has the higher marginal physical propensity to consume B's goods.

This criterion can be transformed into a number of alternatives, most of which are presented by Professor Samuelson in his summary table.[3] In the first place, since the price of B-goods is the same in both countries, multiplication by this price yields a criterion in terms of marginal propensities to spend on B's goods, $C_{ba}-C_{bb}$. Secondly, by making use of the fact that the sum of the marginal propensities to spend on imports and on export goods is unity ($C_{aa}+C_{ba}=C_{ab}+C_{bb}=1$) we obtain the alternative criteria

$$C_{ba}-C_{bb}=C_{ba}+C_{ab}-1=1-C_{bb}-C_{aa}=C_{ab}-C_{aa}.$$

The second of these is the familiar proposition that the terms of trade of the transferor will improve or deteriorate according to whether the sum of the marginal propensities of the two countries to spend on imports is greater or less than unity.[4] Thirdly, by adding $C_{ba}C_{bb}$ to $C_{ba}-C_{bb}$ and subtracting it again, and making appropriate substitutions, we obtain the more complicated criterion $C_{ab}C_{ba}-C_{aa}C_{bb}$ employed by Professor Samuelson. Finally, by factoring out the prices, this last criterion is translatable back into terms of marginal physical propensities, becoming $c_{ab}c_{ba}-c_{aa}c_{bb}$.

In the case of transport costs (real impediments) Professor Samuelson assumes that such costs are met by a deduction from the quantity exported; the quantity received and consumed in the importing country is some fraction k ($k<1$) of the quantity exported. In this case, $q_{ba}=\frac{c_{ba}}{k_b}$, and the criterion for the movement of the terms of trade is $\frac{c_{ba}}{k_b}-c_{bb}$. The presence of the factor $\frac{1}{k_b}$, which is greater than unity, helps to explain the paradoxical result that transport costs may work to turn the terms of trade in favour of the transferor; by assumption, a given increase in A's consumption of B's good increases B's exports more, the greater the transport costs; but against this must be considered the effects of transport costs in lowering A's marginal physical propensity to import and increasing B's marginal physical propensity to consume home goods.

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[1] Strictly speaking, the transfer should be measured in units of one or other commodity as numeraire, since money does not belong in this type of model; but it is convenient to work with money, and it makes no difference to the result, particularly as the price-ratio between the commodities is assumed constant. It should perhaps be remarked that while we follow the convention of treating the transfer problem in terms of a transfer of income, there is no justification for regarding this convention as realistic.

[2] Alternatively, the terms of trade will turn in B's favour, remain unchanged, or deteriorate, according to whether $q_{ba} \overset{>}{\underset{<}{=}} c_{bb}$. The form of statement adopted in the text is intended to economise on symbols; the reader may translate into the alternative form for himself.

[3] II, *loc. cit.*, p. 286.

[4] *Cf.* J. Viner, *op. cit.*; J. E. Meade, *The Balance of Payments* (Oxford University Press, 1951), pp. 88–93; P. A. Samuelson, I, *loc. cit.*, p. 286, footnote 1.

Owing to transport costs, the price of B's good in A will be $\frac{1}{k_b}$ times its price in B; consequently, on multiplying the above criterion by the price of B's good in B we obtain the same criterion as before in terms of marginal propensities to spend on B's good, namely $C_{ba}-C_{bb}$.[1] This is not really surprising, since by our assumption that transport costs are incurred in B's good, money spent in A buys the same quantity of B's good as money spent in B; the only difference is that some of the good is consumed in the process of transport from B to A, and only a fraction is left for consumers in A.

As in the case of no trade impediments, the criterion in terms of marginal propensities to spend on B's good can be transformed into the alternative forms

$C_{ba}-C_{bb}=C_{ba}+C_{ab}-1=1-C_{aa}-C_{bb}=C_{ab}-C_{aa}=C_{ab}C_{ba}-C_{aa}C_{bb}$. By dividing this last criterion by the prices of exports in foreign markets, we obtain a criterion in terms of marginal physical propensities, $c_{ba}c_{ab}-k_ak_bc_{aa}c_{bb}$.

In the case of tariffs (artificial impediments) the quantity received and consumed in the importing country is equal to the quantity exported; the criterion in terms of marginal physical propensities is therefore the same as in the no-impediments case, $c_{ba}-c_{bb}$. These propensities, however, have a different meaning than have those in the preceding two cases, since they include both the direct changes in demand resulting from the transfer and the indirect changes in demand resulting from consequential changes in the amount of tariff proceeds redistributed (by assumption) to the community.[2]

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[1] $C_{ba}=\pi_b c_{ba}=\frac{\rho_b}{k_b}c_{ba}$, where π_b and ρ_b are the prices of B's good in A and in B.

[2] The total change in money income and expenditure (income received plus tariff redistributions) resulting from a unit increase in income received is

$$1+(1-x)\,C'_m+(1-x)^2C'^2_m+\ldots=\frac{1}{1-(1-x)\,C'_m}$$

where C'_m is the marginal propensity to spend on imports from an increment of money income and $(1-x)$ is the proportion of tax receipts in the domestic price of imports. The "total" marginal physical propensity to consume employed in our analysis is therefore the marginal physical propensity to consume from an

Owing to the tariff, the price of a good will be higher in the importing country's market than in the exporting country; let x $(x<1)$ be the ratio of the net (or domestic) price of the good to its tax-inclusive price. Then the criterion in terms of marginal propensities to spend on the transferor's good, found by multiplying the "physical" criterion by the domestic price of B's good, is $x_b C_{ba} - C_{bb}$.[1] The presence of the factor x_b, which is less than unity, helps to explain how the assumption of tariffs may rescue the "orthodox" presumption that the terms of trade will turn against the transferor, since for a given marginal propensity to spend on imports the higher is the tariff the lower will be the marginal physical propensity to import; but this influence may be outweighed by the effects of tariffs on the marginal propensities to spend on the transferor's goods.

On the assumption that the receipts from the tariff are redistributed to deserving citizens, that portion of the increased expenditure on imports by the transferee which does not accrue to exporters in the transferor country (but instead is collected in taxes) must be spent on its own goods; and the sum of the increase in receipts by the transferor and the increase in expenditure on its own goods by the transferee must equal the amount of the transfer (i.e. $x_b C_{ba} + C_{aa} = x_a C_{ab} + C_{bb} = 1$).[2] Making use of this relationship, we obtain the alternative criteria

$$x_b C_{ba} - C_{bb} = x_b C_{ba} + x_a C_{ab} - 1 = 1 - C_{aa} - C_{bb} = x_a C_{ab} - C_{aa} = x_a x_b C_{ab} C_{ba} - C_{aa} C_{bb}.$$

Dividing this last criterion by prices net of tax, we obtain another criterion in terms of marginal physical propensities, $c_{ba} c_{ab} - c_{aa} c_{bb}$.[3]

In summary, we have derived two sets of criteria—physical and monetary—for each of our three cases; all of these criteria have been derived from one physical criterion, $q_{ba} - c_{bb}$, the effect of the transfer on the quantity of the transferor's good demanded at constant prices. The physical criteria are formally the same for the no-impediments and artificial-barriers cases, because physical quantities exported and imported are identical in these two cases; but the monetary criteria are different because with tariffs part of one country's expenditure on

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increment of money income, multiplied by this ratio. For example

$$c_{bb} = \frac{c'_{bb}}{1 - (1 - x)\,C'_{ab}} \text{ where } c'_{bb}$$

is the marginal physical propensity to consume from an increment of money income.

[1] $C_{ba} = \pi_b c_{ba} = \frac{\rho_b}{x_b} c_{ba}$, where π_b and ρ_b are the tax-inclusive and net prices of B's good.

[2] The fact that the two marginal propensities to spend add to more than unity is due to the fact that $(1 - x_b)\,C_{ba}$ is "dummy" expenditure which returns to the community through the redistribution of tax receipts; alternatively, the extra "income" which the community has to spend as a result of the transfer is greater than the amount of the transfer by the amount of the increase in (redistributed) tax receipts. See the last footnote but one.

[3] These last two criteria, $x_a x_b C_{ab} C_{ba} - C_{aa} C_{bb}$ and $c_{ba} c_{ab} - c_{aa} c_{bb}$, can be converted into expressions in terms of marginal propensities to consume and import from an increment of money income, by dividing by the two "multipliers" relating the changes in income plus redistributed tax receipts to changes in income. The resulting criteria are those used by Professor Samuelson.

imports does not accrue to the other country as sales receipts. The monetary criteria are formally the same for the no-impediments and real-barriers cases because, due to the assumptions made about transport costs, expenditure on imports by one country is identical with sales receipts from exports by the other in both cases; but the physical criteria are different because with transport costs physical imports are less than physical exports.

It is interesting to observe that the one criterion which is common to all three cases is the one which is seldom if ever explicitly applied. This is the criterion $1 - C_{aa} - C_{bb}$, which states that the terms of trade of the transferor improve, remain unchanged, or deteriorate according to whether the sum of the two countries' marginal propensities to spend on their own goods is less than, equal to, or greater than unity. This criterion can be established directly, by considering the effect of the transfer on expenditure on the transferor's goods and using the fact that the part of the transfer not paid by the transferee in exchange for the transferor's good must be spent by the transferee on its own good.

The argument presented in the preceding pages has reproduced and extended the criteria for the effects of a transfer on the terms of trade established in a more elegant fashion by Professor Samuelson. Some features of the present argument do, however, raise some questions about the general validity of the similarities and differences between the criteria for the three cases discussed in the last paragraph but one. In particular it will be recalled that the difference between the foreign-market and home-market price of a good created by trade barriers represents in the case of transport costs the additional expenditure on that good required to transport it, while in the case of tariffs it corresponds to expenditure on its own good by the importing country.[1]

Consideration of the contrast between the two cases suggests that a change in our assumptions about the nature of transport costs to allow for the using up of some of both goods in the transport of each commodity would alter the criteria for the effects of a transfer on the terms of trade, and that in the extreme case of transport costs incurred entirely in the good of the importing country the criteria would have the same form as in the case of tariffs. These suggestions are borne out by the detailed analysis presented below, which develops criteria applicable to both cases. Furthermore, consideration of our assumptions about the disposition of tariff proceeds suggests an alternative assumption which makes the effects of the two types of trade impediment identical.

In the general case of real impediments to trade, the transport of a good from one country to another absorbs some of both goods. For convenience of analysis, let us divide the process of transport into two stages, separated by a transshipment point, in the first of which transport costs absorb some of the exporting country's good, and in the second of which they absorb some of the importing country's good. Let k $(k<1)$

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[1] This does not mean that the tariff proceeds are directly spent on home goods.

be the proportion of goods exported which is not absorbed by transport costs up to the transshipment point; and let x $(x<1)$, be the proportion of goods shipped from the transshipment point which remains after enough has been sold to pay for transport from the transshipment point to the market. Alternatively, k is the ratio of the home price to the value per unit of the good at the transshipment point, and x is the ratio of the value per unit at the transshipment point to the price in the foreign market.

As in the case of transport costs previously analysed, the criterion in terms of marginal physical propensities for the change in the terms of trade resulting from a transfer is $\frac{c_{ba}}{k_b}-c_{bb}$. The term c_{bb}, however, has a rather different meaning here than in the cases previously analysed, since it comprises both the change in B's consumption of its own goods and the change in the amount of its goods required to transport its imports.[1] Multiplying by the home price of B's good, we obtain a criterion in terms of marginal propensities to spend on B's good, $x_bC_{ba}-C_{bb}$.[2] This can be transformed, by use of the identity of income and expenditure $(C_{aa}+x_bC_{ba}=C_{bb}+x_aC_{ab}=1)$,[3] into the alternative forms $x_bC_{ba}-C_{bb}=x_bC_{ba}+x_aC_{ab}-1=1-C_{aa}-C_{bb}=x_aC_{ab}-C_{aa}=x_ax_bC_{ab}C_{ba}-C_{aa}C_{bb}$. Division of this last criterion by the values of the goods at the transshipment point yields another criterion in terms of marginal physical propensities, $c_{ba}c_{ab}-k_ak_bc_{aa}c_{bb}$.

This set of criteria is different from those derived for the three cases previously examined; the "physical" criteria are formally the same as those for the real-impediments case, and the "monetary" criteria are formally the same as those for the artificial-impediments case. It may be noted that on the opposite assumption about transport costs to that examined by Professor Samuelson—that transport costs absorb only the good of the importing country $(k_a=k_b=1)$—both the "physical" and the "monetary" criteria become formally the same as those for the tariff case.

Since the influence of different assumptions about the distribution of transport cost between the goods of the exporting and importing country on the transfer problem has not been examined by Professor Samuelson, it may be useful to digress on two of the implications of these criteria for that problem.

[1] $c_{bb}=c'_{bb}+(1-x_a)\frac{\pi_a}{p_b}c_{ab}$, where c'_{bb} is B's marginal physical propensity to consume its own good directly, and $(1-x_a)\frac{\pi_a}{p_b}c_{ab}$ (π_a and p_b being the prices of A's good and B's good in B) is B's marginal physical propensity to consume its own good indirectly, in the form of transport for its imports.

[2] $C_{ba}=\pi_bc_{ba}=\frac{p_b}{x_b\,k_b}\,c_{ba}$, π_b and p_b being the prices of B's good in A and in B.

[3] While C_{ba}, for example, is A's marginal propensity to spend on imports, the part of such expenditure which goes to purchase A's good for transport is included in C_{aa}. The sum of C_{ba} and C_{aa} exceeds unity because by definition this sum would involve double counting.

In the first place, it follows from the criterion $x_bC_{ba}+x_aC_{ab}-1$ that, for a given level of transport costs, the larger the proportion of transport cost incurred in the importing country's good (the smaller are x_a and x_b) the less likely it is that the terms of trade will turn in favour of the transferor. Thus if transport costs (at the prices ruling before the transfer) absorbed half the final price of each good and were incurred entirely in the importing country's good, the terms of trade would necessarily turn against the transferor, since in the absence of inferior goods C_{ba} and C_{ab} cannot exceed unity.[1] The introduction of transport costs (or, more generally, of real barriers) incurred in the good of the importing country therefore provides a reason not considered by Professor Samuelson for favouring the " orthodox presumption " that the terms of trade will turn against the transferor.

In the second place these criteria permit us to relax the assumption of symmetrical transport costs for the two goods, and to consider the effects of a transfer on the terms of trade when one country has the major share of the world's transport business. It might be thought that the terms of trade are more likely to turn in favour of the transferor if it has a large share in world transport than if it has not. But this is not so; if transport costs absorb the same share of the final prices of the two goods, a higher share in world transport will increase the likelihood of the terms of trade turning in the transferor's favour only if the transferor's marginal propensity to spend on imports is lower than the transferee's; in the opposite case the likelihood is reduced. Similarly, if the marginal propensities to spend on imports are the same for both countries a higher share in world transport will increase the likelihood of the terms of trade turning in favour of the transferor only if transport costs absorb a larger proportion of the delivered price of the transferor's exports than they do of the transferee's exports.[2] These conclusions follow from the fact that the transfer increases the transferee's and reduces the transferor's demand for imports, and so has both a positive and a negative effect on the demand for transport services; only if the net effect is positive does the transferor gain by having a large share of world transport.

Since the x-coefficients may be employed to represent both the effects of tariffs and the effects of transport costs incurred in the non-imported good, the set of alternative criteria derived above may be regarded as the general case of which the sets of criteria previously established are particular cases. There remains, nevertheless, a substantive difference between the effects of tariffs and transport costs, since the cost of overcoming real impediments to trade is a real loss, while the cost of overcoming artificial barriers is a fictitious loss[1] which returns to the community in the form of distributed tax receipts; and this difference affects the meanings and magnitudes of the marginal propensities appearing in the criteria.[2]

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[1] In the limiting case $C_{ba}=C_{ab}=1$ the terms of trade would remain unchanged. It should perhaps be noted that the argument does not apply to the case of tariffs, since the marginal propensities in the tariff case may, for reasons explained earlier, exceed unity.

[2] Let $t=1-kx$ be the proportion of transport costs in the delivered price of goods and let $b=\frac{1-x_a}{t_a}=\frac{x_b(1-k_b)}{t_b}$ be the proportion of transport costs incurred in the good of the transferor. Then the criterion $x_bC_{ba}+x_aC_{ab}-1$ can be written $(t_bC_{ba}-t_aC_{ab})\,b+C_{ba}+C_{ab}-t_bC_{ba}-1$. A higher share of the transferor in world transport (larger b) will increase or decrease the value of the criterion according to whether $t_bC_{ba}-t_aC_{ab}$ is positive or negative.

This difference, however, arises from our assumption that tariff receipts are redistributed in lump sum payments to the citizenry, an assumption closely related to the modern democratic view of the state as an agency of social welfare. Were we to adopt an old-fashioned ultra-individualistic view of the state as a necessary nuisance,[3] which retains and spends on its own purposes all the taxation it is permitted to collect, and whose activities contribute nothing to the welfare of its citizens, tariff payments would be a real loss to the community in the same way as money spent on transport costs, and exactly the same concepts and analysis would apply to both types of impediment.[4] But this is a comment, not a recommendation.

In conclusion, it may be helpful to state briefly the implications of the argument presented in this note for the classical problem of whether or not there is a presumption that the terms of trade will turn against the transferring country. The most convenient criterion for discussing this problem is $1-C_{aa}-C_{bb}$, which states that the terms of trade will turn in favour of or against the transferring country according to whether the marginal propensities of the two countries to spend on their exportable goods are less than or greater than one half on the average. *In the absence of any information about tastes in the two countries*, there is no presumption that the marginal propensities of the two countries to spend on direct consumption of exportable goods from an increment of money income will be greater or less than one half. Consequently, in the absence of trade barriers, there is no presumption that the terms of trade will turn either way. But in the case of tariffs, part of expenditure on imports will be redistributed as tax receipts and re-spent to some degree on consumption of home goods; and in the case of transport costs, part of expenditure on imports may be spent on exportable goods used in transport. Consequently, in these two cases—tariffs, and transport costs incurred in the exportable good of the importing country—there is a presumption that the marginal propensities of the two countries to spend on their exportable goods will be greater than one half on the average, when changes in indirect demands for these goods are taken into account. There is a presumption, that is, for those who accept this type of argument from ignorance.

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[1] Fictitious in the sense that there is no loss of goods from consumption; there is of course a loss of potential satisfaction resulting from the divergence of marginal rates of substitution in the two countries brought about by tariffs.

[2] For example, c_{bb} in the real-impediments case represents the sum of B's marginal physical propensities to consume exportable goods directly and to consume them indirectly in the form of transport cost; in the artificial-impediments case it represents the marginal physical propensity to consume exportable goods, on the assumption that increases in tariff payments return as increases in disposable income.

[3] Or, in modern terminology, a regrettable necessity.

[4] The division of government expenditure between imported and exportable goods would play the same role as the division of transport costs between imported and exportable goods.

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SUMMARY TABLE: TERMS OF TRADE CRITERIA

	No impediments	*Real Barriers*	*Artificial Barriers*	*General Case*
(*a*) *Real Criteria*— (marginal physical propensities)	$c_{ba} - c_{bb}$	$\frac{c_{ba}}{k_b} - c_{bb}$	$c_{ba} - c_{bb}$	$\frac{c_{ba}}{k_b} - c_{bb}$
All Cases : $q_{ba} - c_{bb}$ (or $q_{ab} - c_{aa}$)	$c_{ba}\, c_{ab} - c_{aa}\, c_{bb}$	$c_{ba}\, c_{ab} - k_a k_b\, c_{aa}\, c_{bb}$	$c_{ba}\, c_{ab} - c_{aa}\, c_{bb}$	$c_{ba}\, c_{ab} - k_a k_b\, c_{aa}\, c_{bb}$
(*b*) *Monetary criteria* (marginal propensities to spend)	$C_{ba} - C_{bb}$ $C_{ba} + C_{ab} - 1$	$C_{ba} - C_{bb}$ $C_{ba} + C_{ab} - 1$	$x_b\, C_{ba} - C_{bb}$ $x_b\, C_{ba} + x_a C_{ab} - 1$	$x_b\, C_{ba} - C_{bb}$ $x_b\, C_{ba} + x_a\, C_{ab} - 1$
All Cases : $1 - C_{aa} - C_{bb}$	$1 - C_{aa} - C_{bb}$ $C_{ab} - C_{aa}$ $C_{ba}\, C_{ab} - C_{aa}\, C_{bb}$	$1 - C_{aa} - C_{bb}$ $C_{ab} - C_{aa}$ $C_{ba}\, C_{ab} - C_{aa}\, C_{bb}$	$1 - C_{aa} - C_{bb}$ $x_a\, C_{ab} - C_{aa}$ $x_a x_b C_{ab} C_{ba} - C_{aa}\, C_{bb}$	$1 - C_{aa} - C_{bb}$ $x_a\, C_{ab} - C_{aa}$ $x_a x_b\, C_{ab}\, C_{ba} - C_{aa}\, C_{bb}$

The British Timber Duties, 1815-60

By J. Potter

While historians have devoted considerable attention to the effects of the Corn Laws on British social conditions in the first half of the 19th century, there has been no correspondingly rigorous attempt to assess the consequences for the British economy of the existence during the same period of high duties on all imports of timber from foreign sources. The probable reasons are not far to seek. R. G. Albion described the timber duties as the " silent partners of the Corn Laws ".[1] The Corn Laws have attracted the attention of historians because they attracted the attention of contemporaries. There was no opposition to the timber duties comparable with the popular, organised agitation of the Anti-Corn Law League.

The chief opponents of the timber duties were in two main categories: merchants engaged in the Baltic timber trade who alleged—and with good reason—that their business was seriously curtailed by the duties which, while admitting colonial timber at nominal rates, approximately doubled the c.i.f. price of Baltic timber; and political economists like Porter, McGregor, McCulloch, Hume and Poulett Thomson, to whom the timber duties represented a particularly pernicious example of mercantilism. Occasionally, as is often the case, motives of personal interest conflicted with those of intellectual conviction. Huskisson was a free trader but was also the Member of Parliament for Liverpool, a port whose timber merchants were mainly occupied in importing from Canada[2]; it is noteworthy that his proposals for commercial reform in March 1825 contained no mention of the timber duties.[3] For Poulett Thomson, on the other hand, there was no such conflict. His father was the head of the firm of J. Thomson, T. Bonar and Company (founded early in the 18th century), importers of Baltic timber. His own youth had been spent in the offices of the family business, both in St. Petersburg and London.[4] That opposition to the timber duties seems to have been confined to these two groups may be accounted for by the unobtrusive way in which they affected the life of the country. The effects of the Corn Laws were seen directly in the price of bread, or at least this is what people believed. The effects of the timber duties were at least one remove further away from everyday life.

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[1] R. G. Albion, *Forests and Sea Power* (Harvard, 1926), p. 401.

[2] " Canada " will be used throughout to refer to all regions now part of the Dominion.

[3] See, e.g. C. R. Fay, *Huskisson and His Age* (London, 1951), pp. 357 ff.

[4] See *Memoir of the Life of the Right Honourable Charles Lord Sydenham*, edited by his brother, C. Poulett Scrope (London, 1843), pp. 1–11. When Thomson, as Lord Sydenham, became the first governor-general of United Canada in 1841, it was feared in some Canadian circles that the appointment was the first step in a policy to sever the imperial link.

On the other hand, powerful interests, both at home and in Canada, supported the retention of the timber duties, and the presentation of their case often appeared to be less marked by special pleading than that of the abolitionists; imperial preference had some emotional appeal and the view that a trade which gave employment to large numbers of British seamen was preferable to one which, allegedly, did not, was still difficult to combat.

The fiscal aspect of the problem cannot be ignored. Between 1820 and 1840 the yearly income from the timber duties was never less than £1 million—a sum large enough relative to total government revenue to cause any government to hesitate before adopting policies which might result in its loss. When, as in the 1830's, successive Chancellors were hard pressed to balance their accounts, there was every incentive to retain the tax for revenue purposes, however strong the argument against it might have been. Opponents of the duties pointed out, of course, that high protection and high revenue were incompatible objectives and that a reduction of the rate of the duties might have been expected to lead to an increase in revenue.[1]

Although the timber duties were not identified, as were the Corn Laws, with the fundamental social and political conflicts of the age, the issues involved were none the less vital in principle, since they concerned the future of the old colonial system. There was greater excitement in Upper and Lower Canada than in Britain when their repeal was under debate.[2]

I

The history of the timber duties has been related in various places[3] and will not be recounted here in detail. The background was the increasing and, from a naval point of view, alarming depletion of British forests from the middle of the 17th century; by the time of the French Wars the navy, and the military security of the nation, depended heavily on Baltic supplies of timber. Colonial policy in the 18th century appeared to have failed entirely to mitigate this dependence. The Treaty of Tilsit and Napoleon's blockade of the Baltic brought the situation to a critical climax. By the end of the Napoleonic Wars, the British government had imposed duties of approximately 100 per cent. on all foreign timber (£3 5s. per load on unsawn timber and a minimum of £8 2s. 6d. per Great Hundred on deals) while colonial timber was admitted at nominal rates. Such a duty prohibited the use of foreign timber for many purposes, and in every year from 1816 to 1846 Canadian timber accounted for at least 60 per cent. of all British imports of unsawn timber and in most years for over 75 per cent.

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[1] e.g. G. R. Porter, before the Select Committee on Import Duties, 1840, V. (601). Q.2713: the existing scale of duties both " caused the employment of an inferior description of timber " and " limited the amount of revenue that might be derived from the importation of timber ". Similar comments before the same Committee: Q.924 (J. McGregor), Q.1449 (J. D. Hume).

[2] See D. L. Burn, " Canada and the Repeal of the Corn Laws " (*Camb. Hist. Journal*, Vol. II, No. 3, pp. 261 ff.), for a general discussion of the effects of the reduction of British imperial preference on Canadian economic development.

[3] e.g. G. S. Graham, *Sea Power and British North America, 1781–1820* (Harvard, 1941), ch. IX.

The duties did not fall with equal severity on all types of foreign timber. The method of assessing duties on deals was such that short deals were charged much more heavily than long. This was of particular significance since Norway was Britain's traditional supplier of short deals of very high quality.[1] Hence the duties not merely discriminated against all foreign timber but discriminated particularly against timber from Norway, the area nearest to British ports, supplying a product which was in very great demand.

Slight modifications were made to the scale of duties in 1821 following the recommendations of the Report of the Committee on Foreign Trade, and the additions made in 1813 for reasons of war finance were repealed. The colonial preference was reduced to 45s. per load of square timber but the duties on deals remained unchanged. No further changes were made until 1843. The duties were successively reduced thereafter, although the preference was not finally removed until 1860 and low equalised duties remained until 1866.

II

The concept of " scarcity " defies definition. A " scarcity " which may in some circumstances be a factor severely limiting economic growth may in others provide a stimulus to the development of substitutes and possibly may lead to greater efficiencies. Professor Ashton pointed out many years ago, that in the British iron industry,

> " the growing shortage of fuel and the restrictive legislation to which it gave rise, turned attention to the possibility of finding in peat or coal an alternative to charcoal ".[2]

Other writers have seen in the relative " abundance " of timber in France a reason for the technological backwardness of the iron industry. Halévy quotes a contemporary French observer, Michel Chevalier:

> " To appreciate the importance of iron you must visit England. The fact that the English are obliged to use it instead of the timber they do not possess, has led them to invent cheap processes for its manufacture, and to put the metal to a larger number of uses, . . . which we on the continent would never have believed possible ".[3]

It is necessary, therefore, to exercise great caution in drawing conclusions about the effects of the high duty on foreign timber. It cannot be presumed *a priori* that the lack of home-grown timber and the restrictions on importation must necessarily have led to a lowering of housing standards. The high price of timber may have encouraged the use of iron for building purposes. On the other hand, when a traveller like Samuel Laing made unfavourable comparisons between housing standards in Norway and in his native land of Scotland,[1] one must pay some attention at least to his remarks.

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[1] Norwegian deals rarely exceeded 12 in. in length. Ms. of H. S. K. Kent's interesting " Anglo-Norwegian Timber Trade in the 18th Century " is with *Econ. Hist. Rev.*

[2] T. S. Ashton, *Iron and Steel in the Industrial Revolution* (1st ed., Manchester, 1924), p. 9.

[3] E. Halévy, *A History of the English People in 1830–1841* (London, 1927), p. 279: quoting Michel Chevalier, *Lettres sur l'Amérique du Nord* (Paris 1836), Vol. 1, p. 349, n. 4.

The British demand for timber was the dominant factor in the international timber trade for the whole of the 19th century; while the timber duties were in operation it provided the main stimulus to the economic development of eastern Canada;[2] between 1850 and 1875, after the reduction of the preference, British demand for timber was one of the main factors in the expansion of Swedish foreign trade and the extension to Sweden of foreign credit, with all that this implied for later Swedish industrial development.[3]

Despite the possibilities of substitution, British timber merchants were eager to obtain all the timber they could at a price at which it could be re-sold on the British market. British timber imports approximately doubled between 1815/19 and 1835/39 and increased by a further 50 per cent. by 1845/49; most of this increase came from Canada since imports from European sources remained fairly constant in volume.

Between 1820 and 1840 the cost of production of Baltic timber was about 25s. per load. Transport costs from Memel were between 20s. and 25s., falling slightly over the period; the average price of Baltic timber in bond was thus about 50s. per load.[4] This seems to be confirmed by Tooke's quotations: the prices of Memel fir which he gives between 1820 and 1839 range from 65s. in 1821 to 35s. in 1830, but the most constantly recurring prices are between 45s. and 55s.[5] To this had to be added the duty of 55s. per load, the British wholesale price being over £5 per load. The price of every load of timber was thus at least doubled by the duty.

The cost of production and transportation of timber coming from Quebec was about 10s. per load higher; with the lower duty of 10s. per load the wholesale price of Canadian timber on the British market seems to have been between 30s. and £2 per load cheaper than that of Baltic timber. Freight rates were of course an important element in the price of Canadian timber. They fell considerably in the course of the century, from between 50s. and 55s. a load around 1820 to between

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[1] Samuel Laing, *Journal of a Residence in Norway during the years 1834, 1835, 1836* (London, 1836).

[2] See, e.g. A. R. M. Lower, "The Trade in Square Timber" (*Trans. Royal Canadian Institute*, Feb., 1932, pp. 40 ff.) and other works. I wish to acknowledge the very great assistance I have received from the published and unpublished writings of Professor Lower, as well as from private conversations.

[3] See E. F. Söderlund, *Swedish Timber Exports, 1850–1950* (Stockholm, 1952), pp. 66, 91, 97–99 and elsewhere.

[4] Report from the Select Committee on Timber Duties, 1835 (519), XIX, 1 (hereafter referred to as C.T.D.), Q.5108 (H. Warburton, M.P., former wholesale dealer in foreign timber).

[5] Thomas Tooke, *A History of Prices*, Vol. II, p. 417, Vol. III, p. 298.

40s. and 45s. in the middle 1820's and, after a period of comparative stability, to about 30s. in 1845, remaining at about that level until the 1880's. It is noticeable that these reductions corresponded fairly closely both in timing and in amount with the reductions in the duties, presumably a reflection, in part at least, of the anxiety of shipowners to keep their ships employed.

The question whether competition from Canadian timber forced down the price of Baltic timber cannot be answered conclusively. Many witnesses before the Select Committee on Timber Duties of 1835 maintained that any reduction in the preference would increase the demand for foreign timber and might therefore be expected to increase its f.o.b. price.[1] But until the large-scale exploitation of Swedish forests began later in the century, the possibilities of decreasing the cost of production in the older producing regions were not very great. The exhaustion of the forests near the ports on the southern shores of the Baltic meant that attention was turned increasingly to the less accessible tracts. Despite the general fall in prices after 1815, the price, excluding freight, of Memel and Riga fir was higher in the 1820's and 1830's than in the closing years of the previous century. The supply of Norwegian deals seems to have reached its zenith at about the turn of the century and to have declined steadily thereafter.

Other witnesses before the 1835 Committee presented the hypothesis that protection enabled Canadian prices to be maintained artificially high.[2] Since the Canadian timber trade was inconsiderable before the duties were imposed, price quotations before that time refer to small quantities of timber and largely to war years when freight charges were greatly inflated or when lack of shipping depressed timber prices both in the Baltic and the St. Lawrence. Oddy, writing in 1805, quotes the price of Canadian timber before that date as about 20s. per load with freights of 80s. or 100s.[3]; Tooke's figures correspond roughly with Oddy's, his range of prices for Quebec fir ranging from 75s. to 118s. per load between 1800 and 1805.[4]

Between 1820 and 1835, the cost of yellow pine at Quebec remained about 20s. per load. Thus the money price of Quebec timber was not greatly changed, although the real cost, in view of the general fall in prices, was somewhat higher. According to the evidence of different witnesses before the 1835 Committee, Canadian f.o.b. prices were from 20 to 50 per cent. higher than Baltic prices for timber of comparable quality.[5] Wastage there certainly was in the Canadian trade owing to working inefficiencies and this was only gradually eliminated.[6]

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[1] C.T.D. (1835), Q.5860 (Hume), Q.266 (J. Mitchell, timber merchant in Russian trade), Q.1202–06 (I. Solly, timber merchant in Prussian trade).

[2] e.g. Q.1173 (Solly).

[3] J. J. Oddy, *European Commerce* (London, 1805), p. 545.

[4] Tooke, *op. cit.*, Vol. II, p. 417.

[5] C.T.D. (1835), Q.5167 (Warburton); Q.303 (Mitchell).

[6] John Rankin, *A History of Our Firm, 1804–1920* (Pollok, Gilmour & Co.) (Liverpool, 1921), pp. 66–7.

It may be noted that British oak also was protected by the duty on foreign oak and similar allegations are to be found that its price was inflated in consequence.[1]

Underlying the many arguments put forward in the 1820's and 1830's about relative prices and qualities was the fundamental assumption among producers and merchants in the Canadian trade that the Canadian timber trade would not survive the withdrawal of protection.[2]

The years of economic prosperity and commercial expansion between Peel's reduction of the preference in 1843 and 1844 and the equalisation of the foreign and colonial duties in 1860 saw a remarkable increase in the quantity of timber imported both from Canada and from the Baltic. The first reduction did not prevent the Canadian trade from continuing its expansion after a short recession,[3] although its expansion was now slower than that of the Baltic trade. Canadian timber found a large market, for instance, in the provision of sleepers during the railway boom of the 1840's. Moreover, by the middle 1840's, some of the technical problems involved in the production and use of Canadian timber seem to have been overcome; the old prejudices were slowly disappearing and witnesses were more willing to agree that, if used in suitable ways, Canadian timber was as valuable as Baltic, especially in shipbuilding.[4] In 1850 Canada was still supplying Britain with more timber, by quantity and by value, than all other sources together. In 1851, when the preference was reduced still further to 6s. 6d. per load, the outgoing tonnage of timber ships from Quebec was almost 600,000 tons, greater than in any previous year. The volume of British timber imports from Canada increased steadily until the early 1860's, but total timber imports were expanding at a faster rate.

Certain branches of the Canadian trade lost ground rapidly after 1851. Up to and including 1853, the British market appears to have been expanding rapidly enough to use all the timber which could be obtained from any source. The repeal of the Window Tax in 1851 provided a temporary boost to consumption. Early in 1852, the price of New Brunswick spruce deals had to be reduced because of the competition from cheap Norwegian white deals which were being imported in large quantities,[5] but by the middle of 1853, it was reported that available stocks were unequal to demand for domestic consumption and for re-export,[1] partly owing to shipping difficulties.

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[1] Committee on Import Duties (1840), V. (601). Q.1437, 1444 (Hume).

[2] e.g. Select Committee on Manufactures, Commerce and Shipping, 1833 (690), VI. 1 (hereafter referred to as C.M.C.S.), Q.6374 (J. D. Powles, merchant and former shipowner). " If by reducing the duty upon Baltic timber one half its present rate [then 55s.] you were to reduce its price in the market by £1 7s. 6d. per load, it would give such an advantage to the Baltic timber that any notion of sustaining a competition between that source of supply and the supply from the colonies would be out of the question ".

[3] Select Committee on British Shipping, 1844 (545) VIII. 1 (hereafter referred to as C.B.S.), Q.942 (H. G. Chapman, Liverpool shipowner and general merchant).

[4] *Ibid.*, Q.328 (J. Somes, Sunderland shipowner in trade with northern Europe), Q.3098 (J. Straker, North Shields shipowner and shipbuilder).

[5] *The Economist*, 24 April, 1852, p. 464; 1 May, 1852, p. 495.

The real test came when the market contracted in 1854 and 1855. At first sight the Canadian timber trade appears to have benefited greatly from the severance of trade with Russia which the Crimean War brought about. The Canadian share of all British imports of building woods had fallen to 46 per cent. by 1853; the Russian share of 10 per cent. of the total in 1853 disappeared in the next two years, the Canadian share increasing correspondingly in 1854.

It is clear, however, from the annual trading reports of Messrs. Churchill and Sim that easy sales at the beginning of 1854, arising presumably from the fear of a timber famine, induced over-trading and a resultant accumulation of unmarketable stocks: "We have mainly to face (in 1855) the large import and great accumulation of colonial deals".[2] The apparent prosperity of the Canadian trade in 1854 begins to appear illusory since, despite the continued absence of Russian supplies, there was no demand in the market. The large stocks depressed all sections of the timber trade for the first few months of 1855 but it gradually emerged that the Canadian trade was the worst sufferer. In June there was a slight recovery, but low prices persisted for colonial wood.[3] In August the demand for foreign wood was livelier but "our colonial deals of pine and spruce are not touched by the present demand for foreign".[4] Sales of Canadian wood continued small at the beginning of 1856, and, after a slight recovery in February, by April the reports are again that the "market for Canadian deal has been quiet . . . several efforts to raise the prices have failed".[5] By July, when the new season's supplies began to arrive, stocks were again high.

This and subsequent evidence gives reason to suppose that when the demand for timber was constricted, the greater loss was borne by the Canadian trade. Imports from Canada did not again reach the 1854 figure until 1861, by which year total British imports had increased by more than 25 per cent.

For the rest of the 19th century the Canadian trade continued to struggle against two major difficulties—high and varying costs of transport and an inability to react quickly to changes in demand. Once the duties on foreign timber were removed, the Canadian trade became a precarious one; imports fluctuated wildly from year to year as, time and again, high-cost stocks accumulated when demand and prices were low. So great are the fluctuations that it is difficult to identify clearly any trend after the mid-1850's: it may be said roughly that the quantity of timber imported into Britain from Canada fluctuated about a constant level in the 1860's; extremely high imports in 1876 and 1877 produce the effect of a slight rise in the trend in the early 1870's; the Canadian trade suffered severely during the central period of the Great Depression, the level of imports in the 1880's being considerably lower than in the 1860's. Relatively, of course, the decline of the Canadian share of the trade was very much more marked, as is seen in the following table, compiled from the Board of Trade Returns.

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[1] *The Economist*, 12 Aug. 1853, p. 912; 27 Aug. 1853, p. 978. There was a sudden demand in 1853 for export to Australia (*ibid.*, *e.g.* 30 July 1853, p. 857).

[2] *The Economist*, 6 Jan., 1855, p. 8.

[3] *The Economist*, 2 June, 1855, p. 601.

[4] *The Economist*, 11 Aug., 1855, p. 883.

[5] *The Economist*, 19 April, 1854, p. 433.

THE CANADIAN SHARE OF BRITISH IMPORTS OF BUILDING WOODS

AVERAGE ANNUAL PERCENTAGE IN FIVE-YEAR PERIODS

1850–54	53·8	1895–99	19·5
55–59	48·5	1900–04	16·8
60–64	41·0	05–09	12·5
65–69	33·2	10–14	10·5
70–74	25·9	15–19	12·3
75–79	24·6	20–24	6·3
1880–84	22·1	25–29	3·5
85–89	19·0	30–34	5·7
90–94	17·3	35–39	15·9

The British timber duties clearly had produced the desired effect of fostering and nurturing the Canadian timber industry.[1] The decline of the British trade did not, however, deal the expected death-blow to that industry. Indeed, it may be suggested that its growth under tariff protection and continued prosperity after the withdrawal of protection is one of the very few known case histories which vindicates the infant industry argument. Two factors made this possible. Firstly, the whole process was extended over a period of 60 years. The Canadian lumber industry was slow to develop to maturity. When this was accomplished, the withdrawal of its supports was an equally slow process, accomplished piecemeal over a period of 20 years, during which time alternative markets could be sought. Secondly, the duties were removed at a time when everything stood in favour of the continued development of the Canadian timber trade. Railway building in Britain, the demands of shipbuilding following the gold discoveries in California and Australia, the Crimean War and the world-wide expansion of trade, and above all the development of trade with the U.S.A., especially after the Reciprocity Treaty, all made it possible for the British timber duties to be withdrawn without causing undue hardship to the interests they had once protected.

But against the creation of a new industry in Canada we have to set the view that the British economy as a whole may have suffered a serious reduction of its efficiency.

III

One of the main arguments repeatedly advanced in support of the timber duties was that the Canadian trade gave employment to British sailors and should be protected on that account. The facts were indisputable. As a cargo, timber had two characteristics, bulk and buoyancy; the first meant that a vast fleet of shipping was needed, the second, that vessels could be employed which were too old for any other use. At a very conservative estimate a fleet of at least 400 ships was required in the 1820's to bring timber from North America to Britain,[1] and of at least 600 ships in the early 1830's. It was suggested in 1835 that 50 vessels could deal with the whole of the remainder of Canadian trade with Europe.[2] More precise figures, brought together in the following table, were compiled and published in Parliamentary Papers for the late 1830's and early 1840's and strongly confirm the argument.

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[1] An effect not universally considered by contemporaries to have been an unmixed blessing for the Canadian economy.

TIMBER SHIPS ENTERED INWARDS FROM THE BRITISH NORTH AMERICAN COLONIES[3]

Year	No. of Ships	Total Tonnage (000's)	Men (000's)	Estimated No. engaged in this trade, irrespective of the repeated voyages	
				Ships	Men (000's)
1839	1,895	656	26		
1840	2,079	754	28		
1841	2,054	851	29	1,643	23
1842	1,223	465	17	978	14
1843	1,841	690	27	1,472	21
1844	1,955	723	27	1,564	21
1845	2,608	964	36	2,086	29

It is not surprising that shipowners engaged in the Canadian timber trade were quick to take alarm whenever the repeal of the timber duties was discussed in view of their almost unanimous assumption that any drastic reduction of the duties on foreign timber would kill the Canadian trade outright. Mr. Alderman Thompson presented a Petition from the Merchants and Shipowners of London on March 15th, 1831.[4] He claimed that the vessels in the Canadian trade were mainly between 500 and 750 tons and that these could not easily be adapted to the coastal trade; there was no prospect of their being transferred to the Baltic trade because of the cheapness of shipbuilding in Prussia and Norway. The timber trade with Canada was entirely in British hands. Lord George Lennox estimated that a reduction in the timber duties would ruin one-fifth of the shipping interest of the country.

Similar alarmist views were repeated before the Committee on Manufactures, Commerce and Shipping in 1833 and again before the Committee on Timber Duties in 1835. Mr. John Spence, a Sunderland shipowner and timber importer, told the former that he anticipated that an equalisation of the duties would mean that 700 ships (out of his estimate of a total of 1,000) " would be laid by the walls and rot ",[5]

[1] C.M.C.S. (1833), Q.3352, 3445 (G. W. Norman, retired merchant).

[2] C.T.D. (1835), Q.2786 (W. Pemberton, merchant of Quebec and London).

[3] Figs. for 1839-40 from A. and P. 1846 (175) XLV; for 1841-45, including the estimates in the last two columns, from A. and P. 1846 (466) XLV.

[4] *Hansard's Parliamentary Debates*, 3rd series, Vol. III.

[5] C.M.C.S. (1833), Q.6969.

since they were of use for nothing else beside carrying timber across the Atlantic.

There are two implicit assumptions behind these fears: firstly, that the Canadian timber trade would not survive the withdrawal of protection; secondly, that shipping which it was supposed would be displaced from the Canadian trade would be unable to find other employment and, in particular, that any resultant expansion of the Baltic trade would be taken up entirely by foreign shipping. It was strongly argued both in 1833 and 1835 that British shipping could never compete with the low costs of foreign shipping in the Baltic where, it was maintained, British ships were already fighting a losing battle to maintain their trading connections.[1] Even the most ardent opponents of the timber duties agreed that their equalisation would occasion hardship to the shipping interest. James Deacon Hume stated, " I conceive that Canada would be little affected; indeed it would be the shipping interest that would suffer most ".[2] He anticipated a decline in British and a corresponding increase of foreign shipping of as much as 80,000 tons.[3] Some of these fears appear to have been justified if we are to believe statements made to the Committee on British Shipping of 1844.[4]

The argument was the old familiar one which urges the maintenance of inefficient methods of production and distribution. There can be no doubt that, if the merchant navy relied on the existence of the timber duties to maintain ships and sailors in employment, then the employment was being paid for by the consumers of timber. The effect is best illustrated by the numerous attempts which were made to evade the payment of duty. Cargoes of European timber were carried across the Atlantic to Canada and then back to the British Isles to be imported as colonial timber. The attention of Parliament first appears to have been drawn to the practice in 1830.[5] Mr. Warburton told the House of Commons that one or more cargoes of Memel timber had, to his knowledge, evaded the duty by first being carried to Halifax and thence imported into Ireland. His figures indicated that there was a saving of 13s. on every ton of Baltic timber brought into the country in that way. A bill was promised to remedy the abuse but never appeared.

We do not know how common this practice was. On March 24th, 1835, Mr. Baring asserted that the practice had been going on for two or three years and that in 1833 no fewer than 1,300 cargoes had been thus imported,[6] a most implausible figure. The government was well aware of the practice and made no attempt to conceal it. Figures were published in Parliamentary Papers from time to time giving details of the number of ships known to have made the round trip; for example, in the year which ended February 7th, 1835, 13 vessels carrying fir, lathwood and staves, took their cargoes from Memel, Riga or Egersund, to Halifax, Pictou or Sydney, and thence returned to London, Liverpool or an Irish port.[1]

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[1] e.g. C.M.C.S. (1833), Q. 8610–15 (A. Gilmour, of Pollok, Gilmour & Co., Glasgow shipowners, stated by Rankin to have owned " the biggest fleet in the United Kingdom in the 1830's and 1840's ", Rankin, *op. cit.*, p. 22); C.T.D. (1835), Q.3655 (W. Allan, Leith ship- and insurance broker).

[2] C.T.D. (1835), Q.79.

[3] *Ibid.*, Q.124.

[4] e.g. C.B.S. (1844), Q.182 (G. T. Young, Chairman of the Shipowners' Society).

[5] *Hansard's Parliamentary Debates*, new series, Vol. XXIV, 14 (8.4.1830).

[6] *Hansard's Parliamentary Debates*, 3rd series, Vol. XXVII, 214 (24.3.1835).

Whether the practice was frequent or not, the fact that any merchant even conceived the idea is indicative of the burden which the timber duties placed on foreign timber. It must have been apparent to the staunchest supporters of the timber duties that such a proceeding was a complete waste of resources and could in no sense be considered beneficial to the country as a whole.

Two other aspects of the Canadian timber ships, while of only marginal significance for this paper, are nevertheless of sufficient general interest to warrant a brief reference at this point.

The unseaworthy condition of many of the ships employed in the North Atlantic timber trade became, in the 1830's, a matter of notoriety. In 1839 Parliament accepted Mr. G. Palmer's motion, calling for the appointment of a Select Committee " to enquire into the shipwrecks of timber ships and the loss of life attendant thereon ".[2] Palmer alleged that in 1834 there had been 21 such wrecks, 4 near the coasts, 17 in the open sea; in 1835, 15 coastal and 34 oceanic wrecks; in 1836, 24 coastal and 44 oceanic wrecks; in 1837, 7 coastal and 23 oceanic; in 1838, 16 coastal and 45 oceanic. The Committee reported in June, 1839, and recommended *inter alia* the prohibition of deck-loads on timber-laden vessels from North America.[3] The recommendation was embodied in immediate legislation, firstly as " an experimental, temporary measure "[4]; the prohibition was subsequently extended in time and made more generally applicable.[5] Thus began Parliamentary control over shipping safety which became increasingly comprehensive in the course of the 19th century—a process in which the famous " Plimsoll " Act of 1876 is only one stage.

The ships which came from Quebec carrying timber to Britain had no obvious return cargo—except human beings.[6] The returning timber ships provided an important means of emigration from Europe to North America for about two decades.[7] In 1835, the fare from the Irish ports to Quebec was from 25s. to 45s. in timber ships.[8] It is no part of our concern here to discuss how many of these emigrants stayed in Canada or how many moved on ultimately into the U.S.A., however interesting such speculations might be.

[1] A. and P. 1835 (62), XLVII.

[2] *Hansard's Parliamentary Debates*, 3rd series, Vol. XLVI, 1303 (9.4.1839).

[3] A. and P. 1839 (333), IX, 223.

[4] *Ibid.*, Vol. XLIX, 420–22 (17.7.1839).

[5] A. and P. 1840 (348), 111, 663.

[6] C.T.D. (1835), Q.1328 (W. Parker, " Gentleman retired " of Cork).

[7] See, e.g. M. L. Hansen and J. B. Brebner, *The Mingling of the Canadian and American Peoples* (Yale, 1940), pp. 107 ff.

[8] C.T.D. (1835), Q.4720. (John Astle, ship-broker and commission agent).

IV

The two main uses for timber in the British economy while the timber duties were in operation were house building and general construction, and shipbuilding. Nassau Senior's attack on the timber duties in the Report of the Commissioners on the Condition of the Handloom Weavers is well known.[1] The appropriate passage deserves to be quoted at length:

> " We agree with those among the weavers who have denounced the Timber Duties as one of their grievances. . . . The favoured timber is far inferior in quality, dearer at its place of shipment and less accessible. The increased price occasioned by the duty excludes Baltic timber from the houses built for the opulent classes . . . it forces the poorer to pay for a bad material a price higher than, in the absence of regulation, they would have to pay for a good one. . . . Nearly half the expense of building is the cost of timber, and half the cost of Baltic timber consists of duty. The reduction of the duty from about 100 to 10 per cent. would enable its use in the dwellings of the poor; it would probably reduce the expense of construction by nearly 25 per cent., and that of repair much more. . . ."

It is not easy to assess the validity of this condemnation. So little is known about the building industry in the early 19th century that final judgment must be suspended. The evidence presented to various parliamentary committees in the 1830's and 1840's—especially the Committee on Timber Duties of 1835—is confused and often conflicting. One point seems to be clear: the duties made the price of Baltic and Norwegian timber prohibitive for the speculative builder. Merchants of Liverpool and Glasgow engaged in importing timber from North America were anxious to show that Canadian timber could be used efficiently and economically.[2] Alan Gilmour stated that Quebec red pine was being used widely for many building purposes in Glasgow and Edinburgh and, in the Glasgow gaol and many Glasgow churches, Baltic timber, found to be " completely rotten with what is spoken of as the dry rot, which I call the damp rot " within 20 years of building had been replaced by Quebec red pine.[3]

In other parts of the country, it appears, builders were less willing to accept the view that Canadian timber could be used to construct houses as durable as those made with Baltic timber. This attitude may have been determined to some extent by conservatism and prejudice;[4] it was certainly due to some extent to technical problems associated with the use of Canadian timber.[1] The main complaint against the timber duties was that they prevented the building of houses which were both cheap and of good quality,[2] and encouraged the use of inferior or unsuitable materials. William Parker, who had been a timber merchant in Cork from 1798 to 1809 and subsequently a speculative builder, said, for instance, that houses for the Irish peasantry had been principally built in the 18th century of Norwegian timber; this was now virtually prohibited by the duties and in consequence yellow pine timber " of a very bad quality " was being used instead. The houses formerly built of Norwegian Long Sound timber were expected to last from 100 to 150 years; the effects of using North American timber were so serious that houses " have been obliged to be taken down within 20 years and rebuilt ".[3] The saving of cost when Canadian timber was substituted for Baltic appears to have been considerable.[4]

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[1] A. and P. 1841 (296), X. 273, p. 71.

[2] e.g. C.T.D. (1835), Q.4642 (John Miller, Liverpool shipowner and general commission agent).

[3] *Ibid.*, Q.3449–50.

[4] *e.g. ibid.*, Q.3072 (Geo. Baker, a London builder): " Baltic timber is principally used in the better buildings in London . . . because it is considered the best and is called the best timber ". Similarly, Q.2996 (John White, architect and surveyor of Whitehall-wharf, Westminster).

The substitution of Canadian timber for foreign timber in cheaper houses can probably be assumed to have led to a deterioration in the quality of houses built if only because builders were forced to use materials to which they were unaccustomed, while it is unlikely that the tenant received any compensation in lower rent.[5] On the other hand, in better class building, the high price of timber may have given added stimulus to the experiments, begun before the turn of the century, with the use of iron, especially for floors and beams, in substitution for timber. By the mid-1830's the use of iron for constructional purposes appears to have been widespread, though of course the timber duties were only one of many factors contributing to this result.[6]

The timber duties thus encouraged the use in building of substitutes for the high-priced Baltic and Norwegian wood. There is reason to suppose that a great deal of the cheaper Canadian timber was used in consequence for unsuitable purposes and this may have been directly responsible for the building of houses of inferior quality. But the simple fact that foreign timber was subject to a virtually prohibitive duty during this period of rapid town growth must in itself severely have aggravated the already serious problem of providing houses for a rapidly growing population.

The arguments advanced against the timber duties with reference to shipbuilding were similar: that they increased shipbuilding costs or that they induced the building of ships of inferior quality. It is clear that it cost more to build a ship in Great Britain than in most—perhaps all—continental countries, and especially in those with easy access to timber. The evidence available suggests that there was a difference of between 25 and 50 per cent. in the costs of British and European shipbuilding.[1]

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[1] Especially inadequate seasoning and the misuse of cheap yellow pine for unsuitable purposes; the more expensive red pine was more readily admitted to be comparable with best Baltic or Norwegian timber, particularly if treated with " Mr. Kyan's patent ". *Ibid.*, Q.2924 (White); Q.3070 (Baker).

[2] e.g. *ibid.*, Q.2934–43 (White).

[3] *Ibid.*, Q.1247 ff.

[4] *Ibid.*, Q.3041 (Baker) states 20 to 25 per cent., as does Nassau Senior, later.

[5] e.g. C.T.D. Q.1468 (Hume): agreed with the Committee chairman that " the hovels in which thousands of our artisans live " both in country districts and in manufacturing towns were very small on account of high building costs of which the cost of timber was " one of the principal parts ".

[6] e.g. *ibid.*, Q. 3459 ff., 3464 (Sir Robert Smirke, architect); Q.3051–2, 3074–5 (Baker).

The question here is to what extent the timber duties were responsible for the high British shipbuilding costs. Various opponents of the timber duties alleged with great vehemence that the timber duties were the chief cause of the trouble.[2] John Mitchell attributed the greater cost of building a ship at Leith than abroad to the timber duties, though conceding that it " may also be on account of the higher wages of the labourers ".[3] He maintained that if the duties were removed or even reduced, he could " contemplate the possibility of foreigners coming to buy ships in this country ".[4] The duty made the use of Norwegian timber prohibitively costly: there were only " perhaps one or two cargoes, all in Scotland, during the twelvemonth ".[5] Another witness presented a petition from Cork shipowners stating that ships " in wreck and leak " sometimes made a perilous journey to Norway or the Baltic for repairs, the duty on the Norway and Baltic timber " operating so heavily against repairs in Ireland ".[6]

The opposing view—that the timber duties had little effect on British shipbuilding costs—was held just as strongly, the main grounds being that foreign timber was little used in shipbuilding:[7] we find in a Report by a special committee of shipowners in 1823, the statement that " a very small proportion of the difference of the cost of building and equipment of British ships arises from direct Duties payable on articles employed therein ".[8] Hume maintained in reply to this argument, that the timber duties not merely protected Canadian softwoods but also British oak.[9]

From the evidence given before the Committee on British Shipping in 1844, it appears that the cost of shipbuilding was at least £1 per ton lower in 1844 than it had been in 1840.[10] The timber duties had been reduced, it will be remembered, in 1842. The fall in shipbuilding costs was attributed to lower timber prices, but not necessarily to the reduction of the duties. The evidence that the two circumstances were connected is far from conclusive.[1] At present we may only say that while the timber duties were in operation, the costs of shipbuilding in Great Britain were higher than on the continent, that the evidence seems to indicate that both the cost of labour and the cost of materials, particularly the price of British oak, contributed to this; it may be alleged that the high cost of materials resulted from the duties on foreign timber; about the time of the reduction of the timber duties, there was a noticeable decrease in shipbuilding costs.

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[1] See e.g. " Correspondence Relative to Petitions of the Ship-owners of the Port of London ", A. and P. 1826–27 (278), XVIII; C.M.C.S. (1833), Q.8758–60 (Gilmour), 3614–19 (R. A. Gray, of Melhuish, Son & Green, shipowners and brokers); C.T.D. (1835), Q.4165, 4170 (R. Anderson, South Shields shipowner and broker).

[2] e.g. C.T.D. (1835), Q.141 (Hume), 1749, Q.1776 (Solly).

[3] Committee on Import Duties, 1840, V. (601). Q.3036 (John Mitchell, Leith merchant).

[4] *Ibid.*, Q.3048.

[5] *Ibid.*, Q.2974.

[6] *Ibid.*, Q.1406 (J. W. Parker).

[7] e.g., *ibid.*, Q.1767 (Solly); C.B.S. (1845), Q.169 (Young).

[8] A. and P. 1826–27 (278), XVIII, 221.

[9] Committee on Import Duties (1840), V. (601). Q.1437, 1444.

[10] C.B.S. (1840), Q.144 (Young) and elsewhere.

Any assessment of the effects of the timber duties on the quality of ships must be extremely tenuous. There is, it seems, no evidence that ships built while the duties operated were any worse or less durable than those built before or afterwards. Obviously, ships built cheaply were inferior to those built more expensively, although this does not dispose of the argument that the duties encouraged the use of inferior materials. A Liverpool shipowner, James Aitken, alleged that the duty made prohibitive the use of Baltic masts, spars and planks which were the best for the purpose.[2] It is very noticeable, however, that masts at least were one commodity which continued to be imported primarily from Canada for most of the 19th century.

Shipowners appear in general to have been more attracted by the extra employment provided for their vessels by the Canadian timber trade than they were inclined to oppose the duties because of the higher costs of shipbuilding. It is abundantly clear from the mass of evidence presented by them in petitions and before the various committees, that they feared the loss of trade much more than they looked forward to a reduction of costs.

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[1] e.g., *ibid.*, Q.322–3 (Somes): " It (the revised tariff) makes no difference because you use no foreign material except in the decks. . . . I happen to be upon the committee of Lloyd's Register, and I may state, that if you use foreign timber in a ship, you get a character not exceeding nine years, but if you use African teak, Indian teak and English oak, you are entitled to a character of twelve years ".

[2] C.M.C.S. (1833), Q.7088, 7172–4, 7192.

Consumers' Behaviour and the Conditions for Exchange Stability

By John Spraos

The proposition that the exchange rate will be stable if the sum of the elasticities of import demand of the home and foreign ("rest of the world") country respectively exceeds unity, rests on the following assumptions: (*a*) that each country's elasticity of aggregate supply is infinite and that its output contains no import component, so that imports consist of final goods only; (*b*) that trade is initially balanced; (*c*) that, for any given national money income, aggregate money expenditure remains constant irrespective of price changes. Other assumptions, which are usually taken for granted, are those of a constant budget surplus, constant money wages, a neutral influence of income redistribution on the parameters of the consumption function, and a perfectly elastic supply of money (bonds), making for a credit system which performs no independent restrictive function.

One can drop one or more of these restrictive assumptions and examine the consequences. In recent years the fashion has been either to drop the whole lot—in the process, however, throwing overboard, into a vast sea of coefficients, the baby as well as the bathwater—or, when the dropping was selective, to jettison assumption (*c*) while retaining all the others. This paper falls exclusively in the latter category, and encompasses, therefore, within its purview only four writings out of the vast literature on exchange stability: those of A. C. Harberger,[1] S. Laursen and L. A. Metzler,[2] W. F. Stolper[3], and A. C. L. Day.[4]

Except for one or two passing references to the variation of investment outlays, all these writings allow only for changes in consumption expenditure. The dropping of assumption (*c*) affects, therefore, the consumption component of aggregate expenditure, but not the investment component. In fact, to ensure rigorous consistency, it is necessary to assume not only that investment outlays are constant, but also that they are confined to domestic goods, whose prices [by assumption (*a*)] do not change, so that the volume of investment is constant too.

The plan of this paper is to set out the relationship between the various conditions for exchange stability formulated by the above mentioned authors, and use this as a framework for making three principal points. (1) That Professor Harberger underestimates the critical value of the sum of import demand elasticities by implicitly assuming that a given change of aggregate personal real income leads to reactions of identical magnitude in aggregate real consumption irrespective of whether the income change is due to price or employment variations, whereas there are *a priori* reasons for believing the contrary. (2) That Mr. Day, while correct in drawing attention to another of Professor Harberger's implicit assumptions—that of zero pure substitution between consumption expenditure and saving—is in error in suggesting that such substitution, when allowed for, will differ in sign as between the two countries. In fact their sign will be the same, except in the singularly odd case of imports as a whole, on the one hand, and savings, on the other, being substitutes in one country but complements in the other. Mr. Day has only argued that they might be substitutes, and the effect of allowing for this cannot be, as Mr. Day suggests that it might, that " the critical sum of the elasticities will become appreciably larger than under the Harberger formula "[1]; the correct conclusion is that it will become smaller. (3) That Professor Harberger's stability conditions rest on a further implicit assumption—that of a special variety of " money illusion ". Not an implausible variety perhaps, but one which, in any event, needs to be brought out. Should one eliminate " money illusion " it will be shown that the critical value of the sum of import demand elasticities will be lower than that of Professor Harberger, and in extreme instances even lower than unity. Thus of the three assumptions listed here as implicitly made by Professor Harberger, the first tends to impart a downward bias to his formula for the critical sum of the elasticities, while the other two impart to it an upward bias. The net effect, which the three factors may have in practice, is impossible to determine *a priori.*

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[1] "Currency Depreciation, Income and the Balance of Trade", *Journal of Political Economy*, Vol. LVIII (1950), pp. 47–60.

[2] "Flexible Exchange Rates and the Theory of Employment", *Review of Economics and Statistics*, Vol. XXXII (1950), pp. 281–99.

[3] "The Multiplier, Flexible Exchanges, and International Equilibrium", *Quarterly Journal of Economics*, Vol. LXIV (1950), pp. 559–82.

[4] "Relative Prices, Expenditure and the Trade Balance: a Note", *Economica*, N.S., Vol. XXI (1954), pp. 64–69.

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The general question with which we are concerned is the critical value which the sum of the two import demand elasticities must exceed in order to secure exchange stability, when assumption (*c*) is dropped. There is a perfectly general answer to this question and it has been arrived at by Professors Laursen and Metzler[2]—namely that the sum of the elasticities must exceed

$$1+\frac{m_h}{s_h M}\cdot\frac{\partial E_h}{\partial p_h}+\frac{m_f}{s_f M}\cdot\frac{\partial E_f}{\partial p_f}\quad\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

where m stands for the marginal propensity to import, s for the marginal propensity to save, M for the initial volume of imports, E for money expenditure on consumption, p for the price of imports in terms of the importing country's currency, this price changing only with movements of the exchange rate and all other prices being constant [by assumption

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[1] A. C. L. Day, *loc. cit.*, p. 69.

[2] *loc. cit.*, p. 296.

(*a*)], and the subscripts h and f indicating whether the symbols appertain to the home or foreign country; where no subscripts are attached it means (i) in the case of M that it has the same size in both countries [by assumption (*b*)], or (ii) that the relationships indicated hold good for both countries, and writing them only once and without a subscript is a shorthand substitute for writing them twice over, but with different subscripts. (This device will be resorted to frequently later on.)

The above formula is perfectly general because it does not imply anything about the direction or magnitude of import price effects on consumption expenditure at given money incomes; in other words, it implies nothing about either the sign or the size of the partial derivative $\frac{\partial E}{\partial p}$. This, however, is also its basic weakness, because, unless it is possible to say something about these things, one is no better off with the formula than without it. It is natural, therefore, that those who have tackled this problem should have tried, by reference to empirical findings or to general principles of consumer behaviour, to go beyond the agnostic stage.

Professors Laursen and Metzler have suggested that the import price effect on aggregate expenditure will be positive, basing this on the evidence that the average rate of saving is lower the lower the real income. Since a rise of import prices lowers the real value of given money incomes it would lead, so it was argued, to a rise of money expenditure, for, were the latter to remain constant, it would mean that the average rate of saving would also remain constant in spite of the fall of real income.[1]

This argument is not unreasonable, but neither is it conclusive. For the evidence adduced in support either rests on cross-sectional studies which, *a fortiori*, take prices as given, or on time series, of which that of real personal income is dominated by employment variation, thereby swamping the effect of price changes on consumption expenditure. Thus the validity of transferring the findings from such evidence to the case of price changes is not beyond questioning, though to deny that they have any bearing at all would be foolish.

If now it is not possible to say anything very definite about the import price effect on aggregate consumption expenditure, might it not be more hopeful if the latter were split up into its two components of expenditure on domestic goods and imports respectively? Let us explore this route. By definition

$$E \equiv p'C + pM$$

where C is the volume of domestic consumption goods and p' their price. Hence, assuming all prices initially unity and holding prices of domestic goods constant,

$$\frac{\partial E}{\partial p} \equiv \frac{\partial C}{\partial p} + \frac{\partial M}{\partial p} + M \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

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[1] *ibid.*, p. 286.

This does not look very helpful, but Professor Harberger, using very skilfully some principles of consumer behaviour, has contrived to make a very elegant transformation of this expression. Indeed, the contention here will be that he has allowed the pursuit of elegance to carry him a little too far. But before proceeding to that let us look at a rather less refined effort.

. . . .

Professor Stolper has arbitrarily assumed that the consumption of domestic goods remains constant irrespective of import price changes.[1] He does not offer any justification for this assumption, and clearly there is none.[2] Its implications, however, for the exchange stability conditions are clear. Aggregate expenditure will change only to the extent that expenditure on imports changes; and the latter will fall, in the face of a rise of import prices, if the import elasticity of demand is more than unity, and rise if it is less than unity.
(2) then reduces to

$$\frac{\partial E}{\partial p} = M(1+e),$$

for the first term of the right-hand side of (2) is assumed zero, and $e \equiv (1/M)\dfrac{\partial M}{\partial p} \equiv$ elasticity of demand for imports (negative). Whence by substitution in (1) we have the Stolper stability conditions: that the sum of the elasticities must exceed[3]

$$1+\frac{m_h}{s_h}(1+e_h)+\frac{m_f}{s_f}(1+e_f).$$

. . . .

Let us now examine how Professor Harberger's results can be derived from (1). Using the results of consumers' behaviour theory (but neglecting socially interdependent preferences) each of the partial derivatives of the right hand side of (2) can be split in two parts: the

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[1] *loc. cit.*, p. 561.

[2] There is no need to argue this, but should it be desired to see it argued, see W. H .White, " The Multiplier, Flexible Exchanges, and International Equilibrium: Comment ", *Quarterly Journal of Economics*, Vol. LXVII (1953), pp. 136–41.

[3] The alternative to speaking of a critical value of the sum of the elasticities which is formulated in terms of an expression that includes the very same elasticities—a somewhat unsatisfactory procedure—is to express the Stolper stability conditions as

$$e_h+e_f+\frac{m_h}{s_h}(1+e_h)+\frac{m_f}{s_f}(1+e_f)+1<0.$$

In actual fact, Professor Stolper, though ostensibly concerned a good deal with exchange stability, never came to grips with the problem. This is not surprising in view of the fact that he appears, throughout, to be under the impression that a floating exchange rate is capable of moving in whichever direction is required to establish equilibrium; of moving, for instance, in favour, if need be, of a currency which is in excess supply at the ruling rate ! Indeed, the above is Professor Stolper's stability formula in that it follows from his assumptions, though he never arrived at it on account of having taken some wrong turns.

income effect and the substitution effect.[1] According to this theory the loss of real income from a price increase is measured by the extra money cost of purchasing the initial bundle of goods. It will be argued that when there are positive savings this implies a degree of " money illusion ", but let us for the moment accept it as it stands. This loss of income—and the same applies, of course, to a gain of income from a price fall—is distributed over the various goods in accordance with the marginal propensities to consume those goods. Thus the change of income from a small rise of import prices is[2] $-M$ (the negative sign reflects the fact that it is a loss of income), and the change in the consumption of imports is $-m'M$ and of domestic goods $-c'M$, where m' and c' are the marginal propensities to import and to consume domestic goods respectively. These marginal propensities are the ones relevant to a change in real income due to price variations, and are primed in order to distinguish them from the corresponding marginal propensities which are relevant to a change of real income due to employment variations. We shall find that this distinction is necessary.

After allowance has been made for changes in the consumption of imports and home goods due to the change of real income implied in a movement of import prices, there remains the pure substitution effect exclusively due to the change of relative prices. Let now X_C and X_M stand for the pure substitution effect of a change in the price of imports on the demand for domestic and imported goods respectively. Then

$$\frac{\partial C}{\partial p} = -c'M + X_C \text{ and } \frac{\partial M}{\partial p} = -m'M + X_M,$$

whence by substitution in (2)

$$\frac{\partial E}{\partial p} = (1 - c' - m')M + X_C + X_M \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

At this stage Professor Harberger introduces implicitly two assumptions which are rather crucial. The first is that the marginal propensity to save s' ($s' = 1 - c' - m'$), which is applicable to real income changes due to price movements, is equal to s, which is applicable to income changes due to employment variations. The second is that $X_C + X_M = 0$. Given these assumptions, substitution from (3) in (1) yields the Harberger formula[3] for the critical sum of the elasticities:

$$1 + m_h + m_f.$$

This is not only elegant and neat but also the coefficients which it contains are familiar and more easily measurable than most. It has to be asked, however, whether the assumptions on which it rests are valid. It is the first assumption—that $s'=s$—that is the more questionable of the two.

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[1] See J. R. Hicks, *Value and Capital*, Oxford: Clarendon Press, 2nd edition, 1946, pp. 29–33, 309.

[2] Given that $E \equiv p'C + pM$, the extra expenditure for buying the same quantities of C and M when the price of imports rises is $\frac{\partial E}{\partial p} = M$.

[3] A. C. Harberger, *loc. cit.*, p. 53.

A change of prices affects the incomes of everybody and the effect on each is not very drastic; a change in the volume of employment, on the other hand, is highly concentrated and the incomes of those affected are drastically altered, even after allowing for unemployment benefit. Whilst, therefore, it is relatively easy to maintain consumption standards, in the event of price increases, at the expense of current savings, there is no option but to reduce them for those becoming unemployed. In the reverse case people who, having been unemployed, had cut their consumption to the bone, will increase it quickly on re-employment, but those who have maintained their customary standard will be much less responsive to a fall of prices. Either way s' would be expected to be larger than s—perhaps very much larger in economies where personal savings are neither very small nor too badly distributed. In that event Professor Harberger's critical value of the sum of the elasticities would be an underestimate as compared with the more general formula

$$1+m_h \cdot \frac{s'_h}{s_h}+m_f \cdot \frac{s'_f}{s_f},$$

since $\frac{s'}{s} > 1$.[1]

Incidentally, the distinction between changes in real income due to price (in "wage units") and employment variations respectively is blurred in the usual estimates of the parameters of the consumption function which are obtained by relating price deflated values of both consumption and income. It will probably not be easy, however, to have this remedied in view of the statistical traps of multicollinearity.

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Let us proceed now to the other assumption of Professor Harberger: $X_C+X_M=0$. The sum of the substitution effects on *all* alternative uses of income is always zero[2] (when units are so chosen that all initial prices are unity). But whilst imports and domestic goods exhaust the range of consumption goods, there is a third use open to one—namely saving. If the substitution effect of an import price rise on saving is indicated by X_S, then

$$X_C+X_M+X_S=0$$

is a proposition of general validity. Professor Harberger's assumption is thus seen to be the special case of $X_S=0$, whose meaning is that should one's money income be adjusted to compensate exactly for the rise of import prices so that one could—should one wish—have the same volume of imports, domestic goods and money savings as before, one would choose to maintain savings at the same figure, though one might indulge in some substitution between imports and domestic goods; or, to put the same thing differently, that a price change of imports (or of any other goods for that matter) will have no pure substitution effect as between consumption expenditure and saving, but only an income effect.

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[1] The percentage difference in the size of the critical value for the sum of the import demand elasticities indicated in this formula, as compared with the conventional critical value of unity, could be, clearly, very considerable. Whatever therefore there may be to be said for the "concession" of Professors Laursen and Metzler (*Review of Economics and Statistics*, May 1954, p. 229) to Professor Haberler's and Mr. W. H. White's criticism that the income effects of altered terms of trade are too small to have an appreciable effect on employment, there is, *a priori*, no reason for assuming such effects to be small on the conditions for exchange stability.

[2] See J. R. Hicks, *op. cit.*, p. 310.

Notice that, should this be true, it would confirm from first principles the conclusion reached by Professors Laursen and Metzler by reference to empirical findings: that $\frac{\partial E}{\partial p}$ is positive. But is it true? The view of the present writer was that it is a reasonable approximation, and Mr. Day's case in denying this has not convinced him that such pure substitution between saving and consumption expenditure as there is could not be neglected as rather insignificant. This, however, is neither here nor there. One guess is as good as another and, when there is no empirical evidence available, it is right that theoretical discussion should explore all routes and take nothing for granted.

Mr. Day considers that the stream of satisfaction from durable consumer goods and the stream of interest on bonds are substitutes.[1] To the extent, therefore, that a considerable part of consumers' expenditure goes to durable goods, and to the extent that some of them are imported, X_S would not be zero.[2] Therefore $X_C+X_M=-X_S$, whence by substitution in (3) and thence in (1) (and taking now $s'=s$) we obtain Mr. Day's formula for the critical value of the elasticities[3]:

$$1+m_h\left(1-\frac{X_{S_h}}{s_h'M}\right)+m_f\left(1-\frac{X_{S_f}}{s_f'M}\right).$$

The question now is the sign of the X_S's. Mr. Day affirms that "To the extent that tastes are similar in the two countries, the responses of total expenditure to a relative rise in import prices are likely to be opposite in sign, because the imports of one country are the home goods of the other".[4] In other words, that if X_{S_h} has one sign, X_{S_f}

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[1] A. C. L. Day, *loc. cit.*, pp. 67–68. The reason for doubting the extent of this is that it overemphasises the rate of interest as a motive for savings, and implies that savings are interest-elastic, for which the evidence, such as it is, provides little support.

[2] By implication Professor Stolper (*loc. cit.*) also assumes X_S not to be zero; instead he takes X_G (and, for that matter, c' also) as zero.

[3] Mr. Day in fact expresses it in a somewhat different form, which, however, is identical in content. The substitution effect on aggregate consumption expenditure (X_E) must be equal but of opposite sign to that on savings. Thus $X_S=-X_E$. Now, $(1/E)X_E\equiv\eta\equiv$ "the substitution term in the elasticity of total expenditure to changes in import prices" (A. C. L. Day, *loc. cit.*, p. 68. Instead of "import prices" Mr. Day's text has "total prices", but this must be a misprint). Hence $X_S=-\eta E$. By substituting in the formula of the text and (following Mr. Day) denoting $\eta\frac{E}{s'M}$ by q, we obtain $1+m_h(1+q_h)+m_f(1+q_f)$, which is the form in which Mr. Day presents it (*ibid.*).

[4] *ibid.*, p. 69.

has the opposite. This is a fallacy. A positive X_S means that imports and savings are (Hicksian) substitutes; a negative X_S that they are (Hicksian) complements.[1] What Mr. Day is saying, therefore, is that, given the same tastes, if imports and savings are substitutes at home, the domestic goods of the home country, which are the foreign imports, are complementary to savings in the foreign country. Clearly a *non sequitur*.

In fact all that Mr. Day has argued previously is that imports and savings might be substitutes. In that event both X_S's would be positive and the Harberger formula, which assumed them to be zero, an overestimate of the value of the critical sum of the elasticities; never an underestimate, let alone Mr. Day's appreciable underestimate.[2]

. . . .

The last question to be examined is the " money illusion " which is implicit in the Harberger formula. It will be recalled that the loss of real income on account of a rise of prices was reckoned to be equal to the extra cost of buying the initial bundle of goods at the new, as compared with the old, prices.[3] Should incomes increase by that amount consumers are supposed to feel exactly compensated. This, however, implies that consumers are concerned only with the money value of their savings, and not at all with their real value.[4] An outlook of this kind is not, it should be emphasised, necessarily irrational. Consumers may have learned from experience that prices often come down after having gone up, and may behave on this assumption with regard to their savings. But in the first place one cannot take it for granted—not even as probable—that they would behave in this fashion, and secondly, should they so behave it should be clearly understood that they are under a " money illusion ".

To the extent that " money illusion " is rational, it is a misnomer; but the technical meaning is clear. If the doubling of all prices and income leaves demand unchanged there is no " money illusion ". Instead of this, however, it is implied in the case considered above that the doubling of all prices and of income-minus-savings is what leaves demand unchanged. It is an amusing, and not a wholly irrelevant, thought to imagine the reaction of a trade union, which has put in a claim for a percentage rise of wages equal to the percentage increase in the cost of living, if it were told that the logic of its case justifies a percentage increase on what its members spend—not on the whole of their wages.

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[1] See J. R. Hicks, *op. cit.*, p. 311.

[2] A. C. L. Day, *loc. cit.*, p. 69. All that is said in the text on the pure substitution effect is unambiguously valid only if money savings are a proper index of real savings even when prices of consumption goods change. This would be the case if the real value of money savings were measured in terms of securities whose prices are assumed, as they are here, to remain unchanged. Mr. Day implicitly adopts this measure of real savings, and, for the purpose of discussing his argument, its appropriateness was granted, leaving it to what follows immediately below to discuss the consequences of measuring the real value of money savings in terms of consumption goods. But the consequences of adopting the latter measure which are in fact discussed in what follows are those on the income effect only. It was not appreciated that they are very considerable on the pure substitution effect as well, and thanks are due to Mr. Pearce for pointing them out so well in his " Note " which follows this paper. It should not go unrecorded that Mr. Pearce noticed independently what, in what follows, is termed the " money illusion " in Professor Harberger's reasoning, and that only an accident of timing compelled him to confine himself to a note instead of having pride of place.

[3] See above, p. 141.

[4] Should Professor Harberger be interpreted as assuming zero initial savings this point would not arise. But there is internal evidence that he is making no such assumption; and if he were making it, it would render his case so special as to make it trivial. This note has been inserted thanks to a point raised by Mr. Harry G. Johnson.

There are more ways than one of eliminating " money illusion ". The simplest is to consider that the loss of real income due to a price rise is not the extra cost of buying the initial bundle of goods, but the extra cost of buying the bundle which one could have bought at the initial prices had one spent *all* one's income in the same proportions as the bundle which one had actually bought at those prices.[1] This means that the change of real income due to a rise of import prices should be considered to be not $-M$ (see page 141) but $-M\left(1+\frac{S}{E}\right)$ (where S is savings, and $S\frac{M}{E}$ the proportion of savings that should be imputed to imports for the purpose of estimating the loss of real income caused by a rise of import prices), and that the income effect on the consumption of domestic goods and imports respectively is $-c'M\left(1+\frac{S}{E}\right)$ and $-m'M\left(1+\frac{S}{E}\right)$. Substituting the last two expressions in (3) in place of $-c'M$ and $-m'M$ (and taking now $X_S=0$) we obtain

$$\frac{\partial E}{\partial p}=\left[1-\left(\frac{c'+m'}{s'}\right)\frac{S}{E}\right]s'M,$$

whence, by substitution in (1) (and assuming $s'=s$) we have

$$1+m_h\left[1-\left(\frac{c'_h+m'_h}{s'_h}\right)\frac{S_h}{E_h}\right]+m_f\left[1-\left(\frac{c'_f+m'_f}{s'_f}\right)\frac{S_f}{E_f}\right]$$

as the Harberger formula for the critical sum of the elasticities, but with " money illusion " eliminated.[2]

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[1] The treatments of Dr. Leser (in his article " The Consumer's Demand for Money ", *Econometrica*, Vol. XI (1943), pp. 123–40) and of Mr. Pearce (in his " Note " below) provide alternative ways of eliminating " money illusion " if the influence of changes in the real value of *previously* accumulated money assets on consumption, for which they both allow, is assumed negligible. If it is not negligible it is itself another source of " money illusion ". (See also the long footnote below, p. 146).

[2] Mr. Pearce in his " Note " arrives very elegantly at two important results: (*a*) that, should Professor Harberger not wish to attribute any " money illusion " to consumers, his reasoning implies a marginal propensity to save of unity; (*b*) that, should there be no " money illusion ", a price change will not affect expenditure out of given money incomes if the marginal propensity to save equals the average rate of saving—a point implied also by Professors Laursen and Metzler (*loc. cit.*, p. 286). These results are consistent with the above formula, for, if the marginal propensity to save equals one, $c'+m'=0$, and the formula reduces to the Harberger version; and, if the marginal propensity to save equals the average rate of saving $\left(\frac{c'+m'}{s'}\right)\frac{S}{E}=1$, and the formula reduces to the traditional value of unity.

Clearly the type of " money illusion " implied by Professor Harberger[1] imparts an upward bias to his formula. Indeed, when " money illusion " is eliminated it turns out that the critical sum may be less than unity. A sufficient condition for this to be the case is that in each country the average ratio of saving to expenditure should exceed the corresponding marginal ratio (i.e. $\frac{S}{E} > \frac{s'}{c'+m'}$ in both countries), for in that event the import price effect on aggregate expenditure $\left(\frac{\partial E}{\partial p}\right)$ would be negative in both countries. The *rationale* of this is that consumers are so concerned at the fall of the real value of their current savings (or, if you like, of the yield thereof), which the price increase has brought about, that in order partly to make up for it they depress their real consumption not only by not increasing their expenditure, but by actually reducing it. In actual fact, however, we should take this to be a rather extreme case, because, for reasons already expounded, s' would be expected to be rather large, and, correspondingly, $(c'+m')$ small.[2]

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[1] By Professor Meade also, by the way. See *The Balance of Payments, Mathematical Supplement*, London: Oxford University Press, 1951, p. 19 *et seq.*

[2] A discussion of the effects of asset variation may be thought to follow logically from here, for the taking into account of the real value of one's current savings carries the corollary of the real value of one's assets also being taken into account. (Collectors of paradoxes will not fail to note the one implied here—that immunity from one cause of " money illusion " means susceptibility to another.) Assets would then be subject to adjustments, when prices change, through the variation of savings as well as through an inter-asset reshuffle. But it can be shown that, when the supply of the relevant asset (chiefly money/bonds) is perfectly elastic, the influence of asset adjustment spends itself out, if the system is stable in the absence of exchange variation. Thus it does not affect exchange stability as such, though it does affect other stability properties of the system not specifically associated with the exchange rate. This is why Mr. Day, who discusses asset variation (*loc. cit.*, p. 67) is right in dropping it out in formulating his amendment to the Harberger conditions for exchange stability. Note that in the Keynesian system, and in the case of the Pigou effect, the relevant asset (cash) is so important because its supply is fixed. On this account, and in order to accommodate the available quantity of money when the demand for it changes, something has to give way: in the case of Keynes the rate of interest, and through it the flow of investment; in the case of Professor Pigou the flow of consumption. But what is more important, and unlike the case examined here, they have to give way *permanently* because the outstanding supply of money is assumed unadjustable.

Mr. Pearce, towards the end of his " Note ", takes the money value of the community's *net* assets as fixed, and hence, contrary to what has been argued here, allows for the flow of savings being influenced by a change in the real value of such assets brought about through a price change. The community's net assets are not, of course, constant; they increase all the time if there are net savings, but it is not an unusual device to regard them in the short run as constant, because the accretions to them are small in comparison with the existing stock. In the present context the real question is how long a period it will take to adjust, through a variation of savings, the real value of assets so as to bring them in equilibrium at the new level of prices, and thereby end that part of the influence of the price change on the flow of savings which is exercised through the effect of such a price change on the real value of the initial stock of net money assets. If this period is very short it would be wrong to lay any emphasis at all on the influence of the change in the real value of assets because they would then have virtually a once-over effect only. If, on the other hand, the period is reasonably long, there is a good deal to be said for emphasising it, as Mr. Pearce does, though the longer the period the lesser the effect at any one time.

This terminates the story. The implicit assumptions of Professor Harberger have been dropped, one at a time, and the consequences for the exchange stability conditions examined. The reader can now easily construct a formula to incorporate their joint effects.[1] (It is not done here for the objective of this note is not formula-mongering.) What, now, can we say in conclusion? Clearly Professor Harberger's elegant formula is too restrictive. Even the less ambitious objective, of determining from first principles the sign only of the import price effect on aggregate consumption expenditure, is seen to be incapable of attainment. One can set out, however, the various factors involved and point to the direction towards which each pulls. Should one wish, then, to exercise one's judgment as to what the sign actually is, it would be an informed judgment.

University of Sheffield.

A Note on Mr. Spraos' Paper

By I. F. Pearce

For at least three reasons it seems appropriate to comment further upon the foregoing paper by Mr. Spraos. Firstly, this otherwise excellent article appears still to contain lingering traces of the misunderstanding which it is one of its objects to expose. Secondly, I believe that the serious consequences of this misunderstanding can in fact be demonstrated more simply and precisely and without the restrictive assumptions introduced by Mr. Spraos. And thirdly, for reasons which will become apparent in the discussion of point two, I am much less pessimistic than Mr. Spraos in regard to the possibility of saying something useful on *a priori* grounds concerning the probable magnitude of $\frac{\partial E}{\partial p}$, the crucial question upon which the whole argument turns.

The point where Mr. Spraos does not seem quite to have cleared up all of the misunderstanding concerns the precise meaning of pure substitution into saving. Professor Harberger, in his attempt to set limits on the value of $\frac{\partial E}{\partial p}$ has assumed that "real" substitution into saving will be negligible. Criticism of this assumption constitutes the central point of Mr. Day's attack. Now it seems important to draw attention to the fact that as between real consumption and real saving *there is no* a priori *reason to suppose that devaluation will bring about any relative price change at all.* The cost of *real* saving will have been affected in much the same way as the cost of consumption. Mr. Day explains that the stream of satisfaction from consumer goods and the stream of satisfaction derived from interest on bonds are substitutes. This is unquestionably true, but no substitution will actually take place until relative prices have changed. Devaluation will increase the cost of consumption but in so doing it will reduce *pari passu* the purchasing power of both money saving and the stream of interest, and hence reduce their real value.

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[1] For full generality it would also be necessary to take account of Mr. Pearce's observations on the pure substitution effects when the real value of money savings is measured in terms of consumption goods.

Of course, if the pattern of current expenditure is different from the intended pattern of expenditure out of past saving and interest streams there may be some relative price change. But it should be noted that unless we know these expenditure patterns it is impossible to say whether the substitution will be into or out of real saving. Now Mr. Spraos, in criticising Mr. Day (p. 143/144), speaks of substitutability and complimentarity in this connection, as if the phenomenon were something to do with the shape of an indifference surface drawn between imports, exports, and utility from saving. But utility from saving has no meaning independent of the prices of imports and exports and any attempt to give it one by means of some arbitrarily chosen price index must either be restrictive or question begging.

Two conclusions emerge. The first is that there are much stronger grounds for arguing in favour of a zero substitution effect than any of the writers under review have consciously realised. (There is in fact a close affinity between this assumption and the randomness assumption introduced below.) The second is that even if we did admit the possibility of a substitution effect we do not know whether the price of utility from consumption has increased or decreased relatively, without a knowledge of the patterns of current and intended expenditure both of which will in any event have changed as a result of the devaluation.

In passing it is worth noting that the money substitution required to achieve any given real substitution must (because of the price change) be greater than the real substitution valued in money terms. It is easy to show that Mr. Spraos' contention that $X_G+X_M+X_S=0$ (p. 142) is true only if X_S is defined as the change in utility derived from saving, and that this will in fact be different from X_{SM}, defined as $\frac{\partial E}{\partial p}$ less the propensity to save multiplied by the money income compensation.

The question of what is substitution effect and what is not is, however, not important in the present context except in so far as it has been used to throw light on the probable value of $\frac{\partial E}{\partial p}$. It is easy to show without reference to this question at all that both Professor Harberger's and Mr. Day's formulæ rest upon assumptions equivalent to saying that the marginal propensity to save is unity. For reasons adequately explained by Mr. Spraos, Professor Harberger puts $\frac{\partial E}{\partial p}$ equal to *sM* where s is the propensity to save and M is the quantity of imports. Write money saving as a function of all prices and money income Y as under:

$$S = S\,(p_1 \; . \; . \; . \; p_n Y).$$

Now it is usually accepted that doubling all prices and doubling money income should in fact double saving[1] and this for the moment will be assumed. (The consequences of not assuming it are of some importance and will be considered later.) By Euler's theorem therefore it follows that:

$$S = \sum_{1}^{n} p_i \frac{\partial S}{\partial p_i} + Y \frac{\partial S}{\partial Y} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Following Professor Harberger we substitute $-sx_i^2$ for $\dfrac{\partial S}{\partial p_i}$ (x_i = quantity taken of the ith good) and s for $\dfrac{\partial S}{\partial Y}$. Hence:

$$S = s\left(-\sum_{1}^{n} p_i x_i + Y\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

But the terms inside the bracket represent simply money income less consumption, therefore $S = sS$

$$\text{or } s = 1$$

Mr. Day's formula implies the same thing also since he has simply added a substitution effect to Professor Harberger's income effect.

The importance of this procedure lies not so much in the fact that it shows up the weakness of Professor Harberger's assumptions, as in the use to which (1) may be put in an attempt to say something which will throw light on the probable limits of magnitude of $\dfrac{\partial E}{\partial p}$; for from (1) above we see that,

$$\Sigma p_i \frac{\partial S}{\partial p_i} = S - sY$$

and this will be zero if the average propensity to consume is equal to the marginal propensity to consume.

At this point it is convenient to raise again the question of homogeneity in prices and income of the savings function since (1) depends upon this. Mr. Spraos suggests that Professor Harberger's and Mr. Day's assumptions would be justified if there were money illusion, the existence of which would of course invalidate the homogeneity hypothesis. I do not, however, share Mr. Spraos' views that the " special variety of money illusion" here required is a "not implausible" variety. For it requires that the individual should appreciate the significance of his loss in real income from consumption and adjust savings accordingly, but that at the same time he should fail to note the loss in the purchasing power of these savings. This seems inconsistent and unlikely behaviour on the part of consumers. More likely is the complete failure to adjust money saving at all, i.e. zero $\frac{\partial E}{\partial p}$; and if this is the case the whole point of the discussion is lost.

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[1] Professor Harberger, in correspondence with the present writer, has indicated that this is what he would wish to say. I should like at this point also to express my indebtedness to Professor Harberger, who, with infinite patience, undertook in correspondence to demolish the prejudices which I had formed against his model, due to the fact that as set out in his paper it appears to me to be overdetermined.

[2] Any change in consumption (money income constant) is of course minus the change in saving.

On the other hand, if we do away with money illusion we should do so completely and take into account not only the loss in the real value of current saving but also the loss in the purchasing power of all accumulated titles to wealth expressed in money terms. Doubling all prices will of course double the money value of tangible assets but it will not double the value of bonds and cash. If we wish to maintain homogeneity we must include a new variable w to represent cash and bonds. Doubling prices and income will not double money saving unless we double also the money value of bonds and cash held. Thus we obtain

$$\Sigma\, p_i \frac{\partial S}{\partial p_i} = S - sY - w\frac{\partial S}{\partial w} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Bearing in mind that we are talking of a community we should expect the bonds part of w to cancel out since every loan must be someone's debt. On the other hand the Government is scarcely likely to wish to adjust its budgetary policy to changes in the purchasing power of the National debt so that cash plus the National debt should represent a reasonable estimate of w. $\frac{\partial S}{\partial w}$ must be expected to be negative since a rise in the purchasing power of wealth holdings will normally induce a reduction in current saving. Hence $\Sigma\, p_i \frac{\partial S}{\partial p_i}$ will be less than $S - sY$.

Now $\frac{\partial E}{\partial p}$ in the case of devaluation means in fact $\frac{\partial E}{\partial k}$ where k is the rate of exchange and

$$-\frac{\partial E}{\partial k}\, dk = \sum_{1}^{r} \frac{\partial S}{\partial p_i}\, dp_i \quad (\text{r} = \text{number of goods imported}).$$

Moreover, the price changes dp will bear the same proportion to prices as dk bears to k, for a percentage change in the rate of exchange leads to the same percentage change in prices. Hence

$$-\frac{\partial E}{\partial k} = \frac{1}{k} \sum_{1}^{r} \frac{\partial S}{\partial p_i} p_i.$$

And if those goods which enter into imports are randomly selected vis-à-vis the values of the $p_i \frac{\partial S}{\partial p_i}$, which seems not unlikely, then $\frac{\partial E}{\partial k}$ will be numerically less than $S - sY - w\frac{\partial S}{\partial w}$.

This formula seems likely to be of value in helping to set limits on the size of $\frac{\partial E}{\partial k}$, particularly as the entities involved are (relatively) easy to calculate or guess at from National income statistics.

As a rough example which may help to give some idea of the magnitudes involved, let us suppose that the money value of bonds falls by an amount dw. Suppose further, that the average individual has half his saving life to replace his lost assets, that his preferences are such that he divides his loss equally between saving and consumption, and that he holds half of his life savings in bonds or cash. His money savings will increase by an amount equal to $\frac{1}{4}S$ multiplied by the proportionate fall in the money value of his bonds.

Thus $$\frac{1}{4}S\frac{dw}{w} = -\frac{\partial S}{\partial w}dw$$

i.e. $$S-sY-w\frac{\partial S}{\partial w}=1\frac{1}{4}S-sY.$$

In this case $\frac{\partial E}{\partial p}$ would be zero if the propensity to save were 25 per cent. greater than the average propensity to save.

One final point. In substituting the above expression for $\frac{\partial E}{\partial p}$ in Mr. Spraos' formula (1) it should be remembered that the s used in this note approximates much more closely to Mr. Spraos' s' than to the s of formula (1) (see p. 138).

University of Nottingham.

The Editions of The Bullion Report[1]

By FRANK WHITSON FETTER

The Bullion Report of 1810 holds a unique place in monetary controversy. It is probably the most famous public document in the history of economics. It is closely associated with the name of Ricardo, although Ricardo did not play the part in the appointment of the Bullion Committee, or in the drafting of the Report, that legend has sometimes assigned to him.[2] If one looks at the Report in terms of logical analysis, it is difficult to explain its contemporary fame, or the continuing interest that economists and the public have had in it for nearly a century and a half. It was poorly written and it made no pretence to originality. Probably few economists would disagree with the judgment of Francis Horner, the Chairman of the Bullion Committee, that it was

> " . . . very clumsily and prolixly drawn; stating nothing but very old doctrines on the subject it treats of, and stating them in a more imperfect form than they have frequently appeared in before. It is a motley composition by Huskisson, Thornton, and myself; each having written parts which are tacked together without any care to give them a uniform style or a very exact connection ".[3]

On many points the analysis of the Report left much to be desired, even for those who might agree with its main conclusions. It oversimplified the problem of resuming specie payments in time of war, and ignored some of the finer points in the analysis of the relation of money, prices and exchange rates. Its fame must be explained not on the basis of logic, but in terms of economics as part of the living fabric of political life. It brought forcibly to public attention a great issue of economic policy, and it gave the prestige of a Parliamentary Committee to the view that the money supply is an important influence on money and on exchange rates. Even for many who might disagree with some of the analysis it became a symbol of the view that a central bank should pay attention to the monetary circulation if prices were to be restrained and exchange stability maintained.

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[1] The material for this article was collected in connection with a study of the English monetary controversy of the early 19th century, for which I received aid from the Committee on Research Funds of the Graduate School of Northwestern University.

[2] I have treated in detail the relation of Ricardo to the Bullion Report in " The Bullion Report Re-examined ", *Quarterly Journal of Economics*, Vol. LVI, August 1942, pp. 655–665, which is reprinted in " Papers in English Monetary History ", edited by R. S. Sayers and T. S. Ashton (Oxford University Press, 1953), pp. 66–75.

[3] *Memoirs and Correspondence of Francis Horner.* Edited by his brother, Leonard Horner. (2nd edition, enlarged, Boston, 1853), Vol. II, p. 20.

When similar problems have arisen in later generations, economists have turned back to the Bullion Report as a bench mark of discussion, either in praise or criticism. Only on this basis can one explain a record of re-publication that I believe has no parallel in the history of public documents in the field of economics: a total of sixteen complete editions, and two partial reprintings, that have come to my attention, in addition to extensive extracts from the Report and from the Minutes of Evidence that appeared in the London press in August 1810, and a full reprint in the issues of *The British Press* from August 13th to 23rd, 1810. And there may be other editions of which the catalogues and bibliographies carry no record.[1] The fact that the Report appeared in five complete editions and a partial reprinting, within two years of its initial publication in 1810, that over a century later three editions appeared shortly after World War I, and, that the University of Sydney, when it started its " Reprints in Economics and Economic History " in 1951, selected the Bullion Report as the initial volume in the series, is all evidence of the enduring appeal that this historic document has for economists and for students of public policy. The details of these editions are more than a bibliographical record; they are part of the history of monetary controversy. Only the Overstone reprint was the work of a bibliophile. The University of Sydney reprint was designed primarily to meet student needs, but all of the other editions were inspired by a contemporary debate on monetary policy.

1. " Report, together with Minutes of Evidence, and Accounts, from the Select Committee on the High Price of Gold Bullion. Ordered, by the House of Commons, to be printed, 8 June 1810 ". Pp. 232.

This was the official folio edition, in Parliamentary Papers, 1810, Vol. III, and according to *The Morning Chronicle* of August 13th, 1810, it " was delivered at a late hour last night ".

2. " Report, together with the Minutes of Evidence, and Accounts, from the Select Committee on the High Price of Gold Bullion. (Ordered by the House of Commons, to be printed, 8 June 1810) ". London: Reprinted for J. Johnson & Co., St. Paul's Churchyard and J. Ridgway, Piccadilly; by Richard Taylor & Co., Shoe Lane, 1810. P. X, 78, 237 and 115.

This edition, generally referred to as the octavo edition, was listed under " Books Published this Day " in *The Times* of September 23rd,

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[1] Nicholas Vansittart, in the Commons debates on May 13, 1811, spoke of the Report as " translated . . . in every country in Europe " (*Hansard*, Vol. XIX, p. 4). Extracts of the Report appeared in the Continental press, but a search of bibliographies and many inquiries of European economists have failed to turn up any trace of a Continental edition in pamphlet or book form, other than the French translation of 1865 (Item 9). At one time, however, Friedrich Gentz planned to bring out a German translation of the Report and of portions of the Minutes of Evidence, together with an analysis of the Report, as indicated by an undated memorandum to Adam Müller, probably written in 1812, but erroneously assigned to 1802 by his editor. *Briefwechsel zwischen Friedrich Gentz und Adam Heinrich Müller 1800–1829*, Stuttgart, 1857, p. 3.

1810. Ricardo used this edition in making his notes on the Report and Minutes of Evidence, that are reproduced in his " Works ", Vol. III, pp. 327–348; and today it is more often encountered than is the folio edition. It differs from the folio edition in a few minor details, which are discussed by Edwin Cannan in the preface to the second edition of " The Paper Pound " (item 17).

Evidently both of these editions were soon sold out, as on November 16th, 1810 Francis Horner wrote to his old Edinburgh teacher, Dugald Stewart, that he could not send him a copy of the Report: " It is now out of print ".[1]

3. " Report of the Select Committee on the High Price of Gold Bullion . . ." Reprinted for C. Cradock and W. Joy, Paternoster Row; and E. Charnley & Son, Newcastle; by S. Hodgson, 1810, Pp. 89.

This rare edition was announced in " Books Published this Day " in *The Times* of December 6th, 1810. It is not mentioned in any literature on the Bullion Report, and the only copy that has come to my attention is in the Library of Congress. It follows the text of the octavo edition, but has several errors and omits all references to accounts and minutes of evidence.

4. *The Times* of December 13th, 1810 announced " a new and complete edition " by J. Johnson & Co. This is identical with item 2, except that the title page carries the full name of the Report, involving the additional words " and to take into Consideration The State of The Circulating Medium, and of The Exchanges Between Great Britain and Foreign Parts ", and that the name of " Rt. Hon. Charles Long ", omitted from the list of members in the first octavo edition, is here included.
5. Hansard, " The Parliamentary Debates—First Series ", Vol. XVII. London 1812. Pp. cci–41xxxiv.

This printing, which follows the folio edition, includes the Minutes of Evidence, but not the Accounts.

6. The Annual Register, or a View of the History, Politics and Literature, for the Year 1810. London 1812.

An abstract of the Bullion Report, containing approximately half of the text, is on pp. 454–478. In the New Series of the Annual Register for 1810 the abstract is on pp. 564–580.

7. " The Financial Register of The United States ". Philadelphia: Wirtz & Tatem, No. 97, South Second Street. Printed by Adam Waldie, 46 Carpenter Street. Vol. I, No. 1, July 5, 1837, pp. 1–13; Vol. I, No. 2, July 19, 1837, pp. 17–32.

All but a few pages of No. 1 and all of No. 2 are devoted to the reprinting of the octavo edition of the Report. The Register has no introductory note on the Report, nor any explanation as to why it was reprinted, but it is a reasonable assumption that it was prompted by the currency disorders of the period in the United States.

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[1] *Memoirs and Correspondence of Francis Horner, op. cit.*, Vol. II, p. 59.

8. " A Select Collection of Scarce and Valuable Tracts and Other Publications on Paper Currency and Banking from the originals of Hume, Thornton, Ricardo, Blake, Huskisson and Others, with a Preface, Notes and Index ". London, MDCCCLVII.

The octavo edition text of the Bullion Report is on pp. 403–474. This volume, edited by J. R. McCulloch, was printed in an edition of one hundred copies for Lord Overstone for distribution among his friends.

9. Extraits des Enquêtes Parlementaires Anglaises sur les Questions de Banque, de Circulation Monétaire, et de Crédit. Traduits et publiés par ordre du Gouverneur et du Conseil de Régence de la Banque de France, et sous la Direction de Mm. Coullet et Juglar. Paris; Furne et Ce; Guillaumin et Ce, 1865. 8 vol.

A translation of the text of ten Reports of Parliamentary Committees from 1810 to 1858; and of portions of the Minutes of Evidence of some of the Committees, but not of the Bullion Committee. A translation of the full text of the octavo edition of the Bullion Report is in Vol. I, pp. 1–62.

10. William G. Sumner. " A History of American Currency. With chapters on the English Bank Restriction and Austrian Paper Money. To which is Appended the Bullion Report ". New York: Henry Holt & Company, 1874.

The folio edition text of the Bullion Report is on pp. 335–391. There are no records on the printings or sales of this volume before 1882, but it was reprinted five times between 1884 and 1896. From 1882 to 1921, when it went out of print, sales totalled 1,542 copies, of which 722 were sold in the years 1892–1897, when the bimetallic controversy was at its height in the United States.[1]

11. Senate Executive Document No. 58. 45th Congress, 3rd Session. " International Monetary Conference held . . . in Paris, in August, 1878 under the auspices of the Ministry of Foreign Affairs of the Republic of France ". Washington: Government Printing Office, 1879.

Pages 364–372 reprint extracts, relating to silver, from the octavo edition of the Report, from the minutes of evidence, and from the accounts. This is preceded by an introductory note on " The Bullion Report and the Silver Question ", signed " H ", and written by S. Dana Horton, the Secretary to the American Commission to the Conference.

This Senate Document also appeared in a " large paper edition ", and in a State Department edition. All three editions are printed from the same type, but the State Department edition has an errata sheet, the " large paper edition " corrects most of the errors noted in the errata, and both have a title page which differs from the original Senate printing.

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[1] Information on the printings and sales of this book, as well as on the reprinting of a portion of it in 1920 (Item 16), are taken from the records of Henry Holt & Co., which are on deposit in the Princeton University Library.

12. " Sound Currency ". Published monthly by the Sound Currency Committee of the Reform Club. New York City. Vol. II, No. 14. June 15, 1895. Pp. 1–28.

A reprint of the folio edition. The Sound Currency Committee of the Reform Club was organised in 1890 to fight for " sound money ", and in 1891 and 1895–1905 published " Sound Currency ", a semi-monthly publication until 1899, and thereafter a monthly and quarterly. The Committee, in its last issue of March, 1905 said of its publications:

> " During the years 1895 and 1896 the committee printed and distributed more than 2,350,000 copies of various issues of ' Sound Currency '. . . . These volumes, together with the compilations made in 1895 and 1896 [items 13 and 14], and known as the ' Sound Currency Red Book ', have come to be generally recognized throughout the country as the most authoritative source of information upon the topics covered. The magazines are preserved in bound form in more than a hundred of the leading libraries of the country, and many special issues have been used for collateral class room work in a number of colleges giving particular attention to political economy " (pp. 171, 175).

No figures are available on this issue of " Sound Currency ", or of the two compendia in which it was included (items 13 and 14), but it is a reasonable surmise that the distribution of the Bullion Report by the Sound Currency Committee exceeded the total of all other editions, before and since.

13. The above cited number of " Sound Currency " (item 12), identical with the original issue except for a new pagination, 141–168, subsequently appeared as part of a bound volume with the title: " Sound Currency 1895—a Compendium of Accurate and Timely Information on Currency Questions Intended for Writers, Speakers and Students ". Reform Club Sound Currency Committee. New York, 1895.
14. The same number of " Sound Currency " (item 12) also appeared in 1896 in a similar volume, with an identical title, except for the date 1896 replacing 1895, and a new pagination 427–454.
15. Edwin Cannan. " The Paper Pound of 1797–1821. A Reprint of the Bullion Report, with an Introduction by Edwin Cannan ". London: P. S. King & Son Ltd., 1919. Pp. xlix, and 71.

A reprint of the octavo edition.

16. William Graham Sumner. " The English Bank Restriction and the Bullion Report of June 8, 1810. Reprinted from

Sumner's History of American Currency, with an Introduction by Stuyvesant Fish. New York: Henry Holt & Co., 1920. Pp. vii, 229–309, 335–391.

This edition, which includes Sumner's chapter on the English Bank Restriction, was printed from the plates of the 1874 book (item 10), with the addition of the Introduction.

It was brought out at the suggestion of Fish, a banker and former President of the Illinois Central Railroad. Fish wrote to Henry Holt & Co. in December 1919, and urged the republication of the Report, in view of the current depreciation of the British pound. He stated that if Holt were not prepared to bring out a reprint he would attempt to have part of the Bullion Report printed in the Congressional Record, "believing as I do that it ought certainly to be in the hands of the public here and abroad before things in England get much worse". About 1,100 copies were printed, but Holt's records suggest that Fish took over most, or perhaps all of the copies, for distribution to his friends. This hypothesis is supported by the fact that the edition is rare: only four of the fifteen largest American university libraries have copies, of which two were gifts; and it appears to be unknown in British libraries, except for a copy, presented by Stuyvesant Fish to Professor Edwin Cannan, in the Cannan collection at the London School of Economics.

17. Professor Cannan, in a second edition of item 15, published in 1925, added a "Preface on the Second Edition"; made some slight changes in the Introduction; corrected several minor errors that had been in the octavo edition, as well as a few errors that the 1919 edition "could claim as its own"; and corrected one obvious numerical error that had been in both the folio and octavo editions.

The first and the second editions are out of print. Many of the records of Staples Press Limited, who have taken over the imprints of P. S. King & Son, were destroyed during World War II, and the company has no information as to the sales of either edition. The Cannan reprints were widely used in connection with college courses in International Trade and Finance in the 1920's, and today are for most readers the most readily available editions.

18. "Report of the High Price of Bullion with Minutes of Evidence". No. 1 in a series of Reprints in Economics and Economic History, issued by the Faculty of Economics, University of Sydney. (Editor: S. J. Butlin, Professor of Economics.) Printed at the University of Sydney, 1951.

A photo-offset reproduction of the Hansard printing of 1812 of the folio edition (item 5). This is the first reprinting of the minutes of evidence since the Hansard edition.

Northwestern University.

The Engineer's Approach to Economic Models

R. G. D. Allen

In an important book[1] recently published, Professor Tustin has given an account of the way in which an engineer looks at economic systems. His book is, inevitably, difficult reading for anyone not used to applied mathematics. Economists will need some urging and encouragement if they are to attempt to follow Professor Tustin's line of argument. The purpose of this article is to provide the encouragement; it is an economist's approach to the engineer's approach.[2]

Part of the difficulty lies in the fact that the kind of mathematics an economist usually acquires is " pure " mathematics, concerned more with basic concepts and methods than with the details and the short cuts of applied mathematical techniques. It follows for example that the economist is looking for broad principles and for general solutions. About the most concrete question he asks is on the lines: for what ranges of values of the marginal propensity to save and of the power of the accelerator does an economic model show damped oscillations?

On the other hand, an engineer like Professor Tustin is skilled in applied mathematics; he knows and uses all the tricks which have been found profitable in practical problems. This is reflected in the exposition of his book. He goes out of his way to explain some things (e.g. vector algebra) which are fairly familiar to an economist with mathematical training. At the same time he does not always explain the short cuts he is taking so that, in following him, the reader tends to find himself facing a blank wall. He uses the jargon of applied mathematicians, and some of their more specialised concepts, without much warning. He scatters around terms such as the " fundamental " and the " modes " of oscillation, or " in-phase " and " quadrature " components, and concepts such as " convolution integrals " appear out of the blue. His account of the Laplace Transform is so dispersed through the text—and in quite involved geometrical and graphical terms —that it provides no real substitute for a formal treatment (as given in simple terms in a book like Jaeger's *An Introduction to the Laplace Transformation*). The point is that these are difficulties many of which Professor Tustin can hardly be expected to have anticipated, and which can be overcome by hard reading and re-reading of the text.

The economist should first try his hand at drawing, for particular economic models, the kind of schematic diagram of the closed-loop type used by engineers. A model consists of a set of equations relating certain variables; the various " legs " of a schematic closed-loop diagram are simply visual representations of these relations. The actual mode of drawing them can be varied a good deal. The method adopted in Figs. I–IV is a variant of that suggested by Professor Tustin; it is probably one which can be readily appreciated by economists. The variables are put in circles joined by lines with arrows to indicate the direction of the dependence; on the line, in a box, is inserted a symbolic expression of the relation concerned. Hence a line going from one circle to another implies that the variable in the second circle is a function of that in the first, the function being indicated by the expressions in the box or boxes on the line. Use is made of operators such as $\frac{d}{dt}=D$ for differentiation, $\int=D^{-1}$ for integration, E and E^{-1} for a shift operator and its inverse. Separate boxes are used for various types of lags when they occur, " Delay θ " standing for a fixed-time delay of amount θ and " $L\lambda$ " for a continuously distributed (exponential) lag of speed of response λ. Constant multiples are denoted e.g. by c.

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[1] Arnold Tustin, *The Mechanism of Economic Systems*, London: Heinemann, 1953, pp. xi + 161, 25s.

[2] A more extended (and more mathematical) version will be included in a text on Mathematical Economics which I have in preparation.

The four systems shown in Figs. I–IV are well known economic models which, between them, serve to illustrate most of the important variations and mutations of macro-dynamic models based on the multiplier-accelerator relation.

Fig. I is the simple continuous model of Phillips (1954),[1] Fig. II is the period model in the " elementary case " of Hicks (1950),[2] Fig. III is the more developed continuous model of Goodwin (1951)[3] and Fig. IV is the early but characteristic version of the model of Kalecki (1935)[4].

An alternative form of the schematic diagram is illustrated for the Phillips model in Figure V. It is this type of diagram which has been developed by engineers over many years and which is used by Phillips himself.[1] The variables are now shown on the lines; they can be regarded as flowing along lines. One variable is changed into another wherever the line hits a box, the relation being indicated by the entry in the box. At a point where lines meet in an open circle (○), the variables are added (+ signs) or subtracted (– signs). At a point where a line goes into a solid circle (●) and then fans out into two or more lines, the variable flows along both or all of the outgoing lines in unchanged form. For simple models and at first sight, such a diagram may be slightly less intelligible to an economist. The advantages of the scheme are that it is more readily extended to complicated models and that it is used in most tests on engineering systems.

Schematic diagrams such as these have both negative and positive uses. To put it no higher, they serve to show up visually the nature, and to check the consistency, of the relations of a model. They are

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[1] A. W. Phillips, " Stabilization Policy in a Closed Economy ", *Economic Journal* (June 1954).

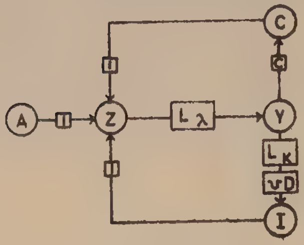
[2] J. R. Hicks, *A Contribution to the Theory of the Trade Cycle* (1950).

[3] R. M. Goodwin, " The Non-linear Accelerator and the Persistence of Business Cycles ", *Econometrica* (January 1951).

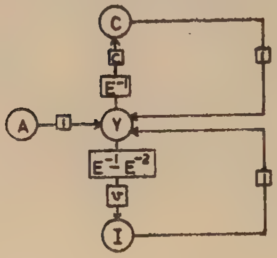
[4] M. Kalecki, " A Macrodynamic Theory of Business Cycles ", *Econometrica* July 1935).

FIGURES

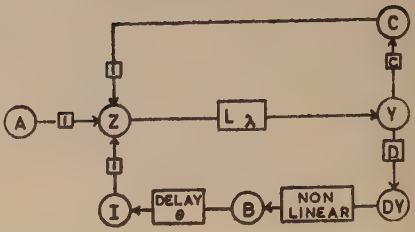
I PHILLIPS MODEL



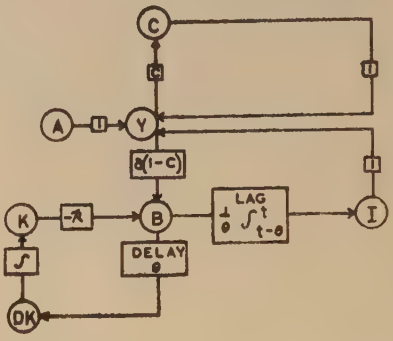
II HICKS MODEL



III GOODWIN MODEL

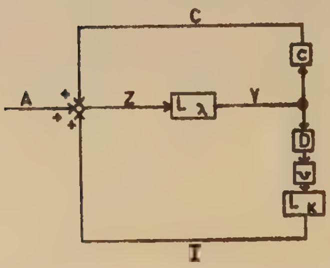


IV KALECKI MODEL



V PHILLIPS MODEL

(ALTERNATIVE SCHEME)



Variables : *A*=autonomous expenditures; *B*=investment decisions ; K=capital stock ; Y=output ; C=consumption outlays ; I=investment outlays ; Z=demand.

helpful in comparing and contrasting one model with another. The four models illustrated show some striking similarities and some equally striking differences. It is quite clear in the diagrams that Goodwin's model is not so clearly related to Hicks' as to Phillips' model, of which indeed it is an extension. The main differences can be summed up by noting that the Phillips model leads to a differential equation, the Hicks model to a difference equation and the Kalecki model to a mixed difference-differential equation, all of them being linear. The Goodwin model is more sophisticated in the sense that it includes a non-linear element which appears in the mixed difference-differential equation of the model. The characteristic of the Kalecki model is that investment depends on two factors—the levels of income and of capital stock—with the result that the diagram has one more loop than the others; the accelerator then appears through the operation of the additional loop involving capital stock.

The diagrams have a more positive use. The engineer employs them in turning the relations of a model into algebraic form for solution. Though they are not absolutely essential, they are here an invaluable guide. The diagrams are equally useful in taking over and applying the engineer's methods in economics. One of the main techniques the engineer has developed, for analysing closed-loop systems which are of linear form, can be described in quite simple terms appropriate to economic as well as engineering models. An outline of this particular technique is given in the following account.

A model or system is *linear* if a sinusoidal variation of the form $Ae^{\alpha t}\cos(\omega t+\epsilon)$ passes through the system with unchanged period or frequency (ω) and unchanged damping (α). All variables oscillate with the same frequency and damping; only their amplitudes (A) and phasing (ϵ) differ, these being parameters fixed for each variable separately by extraneous factors or initial conditions. If the amplitude or phasing of a variable is to be determined structurally then the model must be non-linear. It must be appreciated, however, that a linear model is not confined to relations in which one variable is a constant multiple of another. The relations can include all kinds of derivatives, integrals, differences, delays and lags. This is where the use of operators is so helpful. An operator like $\frac{d}{dt}=D$ for a derivative can be separated from the variable to which it applies and used as though it were a constant multiple.

The basic concepts of the technique to be described are, firstly, the representation of a sinusoidal variable as a *vector product* and, secondly, the expression of a relation between variables by a *transfer function.* The relation and its transfer function can be one " leg ", any sequence of " legs " or the whole of the closed-loop system in the diagram of a given model.

The sinusoidal variable $Ae^{\alpha t}\cos(\omega t+\epsilon)$ is the " real " part of the product of two vectors or complex numbers: $Ae^{i\epsilon}e^{pt}$, when $p=\alpha+i\omega$.

It is therefore convenient to write such a variable as the vector product. Let $Z=Ae^{i\epsilon}e^{pt}$ be a variable of the model, taken as having a given sinusoidal variation (input). A dependent variable (output) is Y; the model being linear, Y must have a sinusoidal variation with the same $p=\alpha+i\omega$ as Z but with different amplitude and phase. Write $Y=Be^{i\eta}e^{pt}$; the problem is to find B and η. The ratio of Y to Z is independent of t, being equal to the ratio of $Be^{i\eta}$ to $Ae^{i\epsilon}$; it can, however, depend on p, on the particular oscillation considered. Hence write

$$\frac{Y}{Z}=F(p) \quad \text{or} \quad Y=F(p)Z$$

when $F(p)$ is some complex number (vector), depending on p, which serves to turn $Ae^{i\epsilon}$ into $Be^{i\eta}$, i.e. to turn Z into Y. $F(p)$ is called the *transfer function* of the dependence of Y on Z. It is a function of a complex number $p=\alpha+i\omega$; its value for a specified p is a complex number. Suppose its value (for given p) is written in polars as $\rho e^{i\phi}$. Hence: $Be^{i\eta}=\rho e^{i\phi}Ae^{i\epsilon}$, or $B=\rho A$ and $\eta=\epsilon+\phi$. The complex number $F(p)$ represents by its polar coordinates the *amplitude ratio* (ρ) and *phase shift* (ϕ) as the sinusoidal variation passes from Z to Y.

Engineers have solved the problem of getting $F(p)$ for any relation in a model (or for the whole system) by the use of operators and operational methods. If the relation is given in analytical form, involving derivatives, integrals, differences, delays and lags, then there is a standard list of " translations " of operators into terms of p. For example, a derivative $D=p$, an integral $D^{-1}=\frac{1}{p}$, a delay $\theta=e^{-p\theta}$, and so on. This can be illustrated by the important case where the relation is a continuously distributed (exponential) lag, defined:

$$\frac{dY}{dt}=K(Z-Y) \quad (K=\text{speed of response}) \dots\dots\dots\dots (1)$$

i.e. Y lags behind Z in such a way that its increase is always proportional to the deficit $(Z-Y)$. In terms of the operator $\frac{d}{dt}=D$, the relation is:

$$Y=\frac{K}{D+K}Z \dots\dots\dots\dots (2)$$

and the transfer function is:

$$F(p)=\frac{K}{p+K} \dots\dots\dots\dots (3)$$

Further, the transfer function $F(p)$ can still be obtained (e.g. by graphical methods) when the relation of Y to Z is not analytical, but empirical. The result here depends on the interpretation of $F(p)$ as a Laplace Transform. Again, the case of a lag illustrates. In the exponential lag (1), find the response of Y to a fixed unit change in Z; (1) is then the differential equation:

$$\frac{dY}{dt}+KY=K \quad \text{subject to } Y=0 \text{ at } t=0$$

which solves to give: $Y(t)=1-e^{-Kt}$
with derivative: $Y'(t)=Ke^{-Kt}$.

Here, $Y(t)$ is the cumulative response and $Y'(t)$ is the distribution of the response over time, i.e. so much added in each time interval. (The distinction is similar to the cumulative and frequency distributions in statistics.) Let $f(t)$ be the time-distribution of response to unit change in Z; here:

$$f(t)=Ke^{-Kt}.$$

Let $F(p)$ be the Laplace Transform of $f(t)$, defined as $F(p)=\int_0^\infty f(t)e^{-pt}dt$. Then it is found, either by evaluating the integral or by using " standard forms " of Laplace Transforms, that:

$$F(p)=\frac{K}{p+K}$$

which is the transfer function (3). The result is quite general; if $f(t)$ is the time-distribution of response of Y to Z in any relation, then the transfer function $F(p)$ is the Laplace Transform of $f(t)$.

The result is very important. If the relation of Y to Z is a lag, the exponential lag (1) or (2) is very simple but may not approximate at all closely to the shape of the lag in practice. There are two possible developments. One is to replace the simple lag by a number (n) of such lags in sequence, with the same overall speed of response. The relation (2) is then replaced by $Y=\left(\frac{nK}{D+nK}\right)^n Z$ and the transfer function (3) by $F(p)=\left(\frac{nK}{p+K}\right)^n$. The other is to take the time-distribution of the lag $f(t)$ and give this an empirical form. $F(p)$ is then to be obtained as the Laplace Transform of $f(t)$.

Once the transfer functions are obtained for all " legs " or loops in the scheme of the model, they can be put together into a transfer function for the whole model. There are rules for this also; for example, if $F_1(p)$ is the transfer function for a loop, and if a second loop with transfer function $F_2(p)$ is coupled on, then the combined system has transfer function

$$F(p)=\frac{F_1(p)}{1-F_2(p)}.$$

For example, a " multiplier " loop with constant c and no lags has transfer function c. If the loop is coupled on to a given system with transfer function $F_1(p)$, the new transfer function is

$$F(p)=\frac{F_1(p)}{1-c}$$

which is the usual " multiplier " effect. The result can be illustrated in various cases of the Phillips model (Fig. I). Take the accelerator loop with no lag ($\lambda\rightarrow\infty$) between Y and Z. The transfer function of this loop, from the diagram and the rules, is $F_1(p)=v\frac{Kp}{p+K}$. Add the multiplier loop and the transfer function for the Phillips model (case $\lambda \to \infty$) is

$$F(p) = \frac{v}{1-c} \frac{Kp}{p+K}.$$

Similarly, for the case illustrated in Fig. I (with λ), the transfer function is

$$F(p) = \frac{v}{1-c} \frac{K\lambda p}{(p+K)(p+\lambda)} \quad \dots\dots\dots\dots\dots\dots(4)$$

These transfer functions apply to the point Z (demand) in the diagram.

The interpretation of the transfer function $F(p)$ for the whole system is vital. It shows the amplitude ratio and phase shift for an oscillation ($p = \alpha + i\omega$) as it passes right through the system. Hence it relates to one variable, and gives the change from the variable as an input to the same variable as a feed-back. In the Phillips model, the variable is Z (demand) and by (4):

$$\frac{\text{Feed-back}}{\text{Input}} = F(p) = \frac{v}{1-c} \frac{K\lambda p}{(p+K)(p+\lambda)} \quad \dots\dots\dots\dots(5)$$

The result depends, of course, on what oscillation goes round the system. So far, no distinction is made between one oscillation and another, e.g. between forced and free oscillations. Suppose p is such that, in a relation like (5), $F(p) \neq 1$. Then the feed-back is not "in tune" with the input at the same point of the system, i.e. the oscillation is *not* self-sustaining. Hence, if $p = \alpha + i\omega$ is a free or self-sustaining oscillation within the system, $F(p)$ must equal 1.

The condition for a self-sustaining variation in a model, with total (or feed-back) transfer function $F(p)$, is quite simple:

$$F(p) = 1.$$

This is an equation in the variable $p = \alpha + i\omega$; it can be solved to give various values of p, each of which is a free variation of the system. It is important to notice that the solution may be a complex root $p = \alpha + i\omega$, in which case the free variation is a sinusoidal oscillation of period $\frac{2\pi}{\omega}$ and damping α. But it may be a real root $p = \alpha$ (ω being zero), in which case the free variation is a steady exponential $Ae^{\alpha t}$, again with damping α. In either case, $\alpha < 0$ implies a damped and $\alpha > 0$ an explosive variation.

The method can now be applied to the Phillips model of Fig. I. From the diagram and the rules, the feed-back transfer function is written down immediately as (5). The condition for free variation $F(p) = 1$ then gives

$$\frac{v}{s} \frac{K\lambda p}{(p+K)(p+\lambda)} = 1 \quad (s = 1-c)$$

i.e.

$$p^2 + \{K - \lambda(vK - s)\}p + K\lambda s = 0 \quad \dots\dots\dots\dots\dots\dots(6)$$

which has two roots, real or conjugate complex. As shown by Phillips (1954), likely values of the parameters (s, v, K and λ) give conjugate complex roots $p = \alpha \pm i\omega$, with $\alpha > 0$. There is then an explosive sinusoidal variation, of the form $Ae^{\alpha t}\cos(\omega t + \epsilon)$, in any of the variables, e.g. income Y.

This is not all. In engineering, closed-loop systems are used as *control* systems; they are adjusted, modified or regulated to produce given results. In terms of the schematic diagram of the model, the regulation may proceed by changing some of the relations (e.g. the lags); more usually, it takes the form of putting in extra loops, feeding-back from one variable to an earlier one in the sequence. By experimenting with different additions of feed-back loops and by re-calculating the transfer function $F(p)$ each time, the equation $F(p) = 1$ can be made to yield almost any free variation considered necessary or desirable. As Professor Tustin points out (p. 72), the methods of analysing closed-loop systems and their regulation

> " have put into the hands of designers the means to combine precision of control with stability, up to limits that have sufficed for almost all the requirements of engineering. They enable the limitations to be avoided that otherwise arise due to the appearance of undesired oscillations, and so have made possible new and effective control devices in almost every branch of industry from radio to oil refineries, such as in the aggregate constitute one of the outstanding advances in engineering of modern times ".

Without setting sights so high, something of the same kind may be expected to apply to economic models. Any of the models of Figs. I–IV can be developed, first by adding extra relations and variables to make them more " realistic ", and then by including additional loops as a matter of deliberate policy in economic regulation. Consider the possible (but simple) forms of regulation of the (simple) model of the multiplier-accelerator designed by Phillips (1954). The regulation is achieved by adding government or official demand G to the demand Z of the model, and by making G depend, with a lag, on income Y in various ways. Combine three kinds of policies, described by Phillips as proportional, integral and derivative, include an exponential lag (speed of response β) and so write

$$G = -\frac{\beta}{D+\beta}(f_v Y + f_i \int Y dt + f_a DY)$$

where f_v, f_i and f_a are multiples to be fixed. In terms of the diagram, this is a feed-back loop (or a combination of three loops in parallel) from Y to Z in Fig. I. The transfer function of the added feed-back loop, with allowance for the lag between Y and Z, and for the multiplier loop (with transfer function $c\frac{\lambda}{p+\lambda}$), is found to be:

$$F_2(p) = -\frac{\beta\lambda\bar{G}}{(p+\beta)(p+\lambda)} \frac{1}{1 - c\dfrac{\lambda}{p+\lambda}}$$

i.e.
$$F_2(p)=-\frac{\beta\lambda\bar{G}}{(p+\beta)(p+\lambda s)}$$

where $\bar{G}=f_p+\frac{1}{p}f_i+pf_a$. The transfer function of the unregulated model is given by (4) above, now denoted $F_1(p)$. Hence, the regulated model has transfer function (at the point Z in the accelerator feed-back):

$$\begin{aligned}F(p)&=\frac{F_1(p)}{1-F_2(p)}\\&=\frac{K\lambda vp}{(p+K)(p+\lambda s)+\beta\lambda\dfrac{p+K}{p+\beta}\bar{G}}\end{aligned}$$

on reduction. Equate to unity for free variations and the equation in p obtained, replacing (6) of the unregulated model, is:

$$p^2+\{K-\lambda(vK-s)\}p+K\lambda s+\beta\lambda\frac{p+K}{p+\beta}\bar{G}=0 \quad \ldots\ldots\ldots.(7)$$

In general terms, with unspecified values of the (now long) list of parameters, not very much can be said about (6) and even less about (7)—except that they are ordinary polynomial equations from which p can be found in any particular case. It is mainly a matter of experimenting with different parameters. As a numerical case (one used by Phillips) take for the unregulated model:

$$s=0\cdot25,\ v=0\cdot6,\ K=1,\ \lambda=4$$

and for the added regulatory loop:

$$f_p=2,\ f_i=2,\ f_a=0\cdot55,\ \beta=2.$$

Then (6) becomes $p^2-0\cdot4p+1=0$
with roots $p=0\cdot2\pm0\cdot98i$
and (7) becomes $p^4+6p^3+20\cdot6p^2+34p+16=0$
with roots $p=-0\cdot74,\ -2\cdot17$ and $-1\cdot55\pm2\cdot76i$
which can be found graphically. The unregulated model has a free variation which is an explosive oscillation ($\alpha=0\cdot2$). The regulated model, apart from two highly-damped exponential variations, has a free oscillation which is heavily damped ($\alpha=-1\cdot55$).

It is time to take stock. A linear closed-loop system comprises a set of relations involving derivatives, integrals, differences and lags of various kinds. In the transfer-function method this is replaced by a purely algebraic equation $F(p)=1$. The translation is achieved by operational methods; if the relations are analytical it is only necessary to write (e.g.) $D=p$, but for other and empirical relations Laplace Transforms are used. The condition $F(p)=1$ is an algebraic expression of the fact that a sinusoidal oscillation (or exponential) runs through a linear system with unchanged frequency and damping and, if it is to be a free variation, it must feed-back with the same amplitude and phase as it has as an input. The frequency (ω) and damping (α) of a free variation are found by ordinary algebraic methods, by solving $F(p)=1$

for $p=\alpha+i\omega$. It is all very quick and simple, apart from the computational problem of solving algebraic equations of high order and mixed type. In moderately complicated cases, the computational work can be done graphically, e.g. with the aid of Nyquist diagrams. A skilled engineer can find the solution of a particular model from such a diagram; but he can also guess, from his experience of the diagrams, the proper modifications to be made so as to stabilise the system in any particular way. In more involved systems the computational job must be laid out for mechanical solution, and particularly for the use of analogue computers of modern high-speed type.

It also sounds too good to be true; and, indeed, there are serious limitations. In the first place the method is designed more for computation of particular cases than for general solutions of closed-loop systems. It is not usually possible to find a complete solution, for any values of the parameters of the model and for any type of regulating feed-back. The job of computation is a heavy one, that of repeatedly finding solutions in a series of particular cases.

Secondly, the method gives only the frequency and damping of the free variation, these being the same for all variables of the system. It does not provide the complete time-path of any one variable since the amplitude and phase, as well as mean or ultimate level, need to be determined separately for each variable from initial conditions. In those cases where the system reduces to a linear differential equation there is an alternative—to solve the equation by the method of Laplace Transforms. In this case the alternative method takes more time but is often preferable since it gives the time-path of any variable as well as its frequency and damping. The Phillips model of Fig. I is of this kind. Equally, when the system reduces to a linear difference equation (as with the Hicks model of Fig. II), there are methods of general solution; these are not as highly developed as for differential equations and the final computation of the time-path of a variable may be a matter in the end of step-by-step computation from the difference equation. However, when the system either gives an equation of mixed form or is of empirical type, then there is no ready alternative to the transfer-function method.

Thirdly, the most important limitation of the method is that it applies only to linear systems. Whatever may be the case in engineering problems, this is a very serious matter in economics. Symmetric oscillations of sinusoidal form with amplitudes fixed by initial conditions—the solution appropriate to linear systems—are by no means realistic in economic terms. It is only a model with non-linear elements that can account for the double feature characteristic of economic variation: non-symmetric oscillations with amplitudes determined by the structure of the system. When a non-linear feature is built in the system, as in the Goodwin model of Fig. III, the transfer-function method ceases to apply. It is only quite recently that other methods, with applications to non-linear models, have attracted the attention of engineers and much still remains to be done in developing them.

To conclude, an economist cannot expect to turn to the engineer for complete and immediate solutions of the problems of economic regulation and stabilization. But he has much to learn from engineering experience. There is the importance of the form of such relationships as time-lags, a matter which greatly affects the nature of the solution itself. There is the difficulty of handling non-linear elements and hence the need for careful consideration of how and where to introduce them. There is the fact—perhaps reluctantly accepted by many economists—that progress in designing and regulating economic models depends more on heavy computation and the full use of computing devices, than on any attempt to get general solutions. Until the engineer's experience is appreciated and assimilated, there is little hope that the economist can develop macro-dynamic models to the point where there is a chance of practical application.

The London School of Economics.

Book Reviews

The Economist in the Twentieth Century and other Lectures in Political Economy. By LIONEL ROBBINS. Macmillan & Co. Ltd. 1954. xi + 225 pp. 16s.

Professor Lionel Robbins writes in a very smooth and pleasing style and expresses himself so clearly that the reader is never in doubt as to what he intends to convey. But this very smoothness and simplicity should not be allowed to obscure the fact that Professor Robbins has many valuable things to say and things, moreover, that badly need to be said. He is courageous enough to stress the importance of not undervaluing simple truths in political economy, and at the same time he warns us against the not infrequent misconception that the basic criteria of economics are applicable only to a competitive society and not to the mixed societies in which we now live and are likely to live in the future. Indeed, he finds that the increased demand for trained economists—not least on the part of private enterprise—is due to a need felt for the particular kind of analysis which economists are able to provide. It is indeed realised in many countries that under present conditions the ordinary flair of the business man—important though it still remains—is no longer found sufficient now that, for instance, the scope of governments' activities have been so greatly enlarged.

While Professor Robbins adheres to the view that economic technique does not in itself furnish guidance on ethical standards, he is convinced that economists ought not to refrain from participation in current discussions of what may usefully be described as questions of *political* economy. This is not only because the economist's training gives him a special aptitude for such discussions but also because the politician, influenced, as he generally is, by the currents of public opinion, stands in great need of comment from independent experts.

The longest article in the present volume of lectures is entitled " Full Employment as an Objective " and consists of an examination of the ambiguities both of definition and implication in the concept of full employment, as revealed in particular by Lord Beveridge's well known dictum that there should always be more vacant jobs than unemployed men. It is Professor Robbins' opinion that such an aspiration will create conditions incompatible not only with stability but also with liberty. The first danger is one of inflation, for whenever there is, at current rates of wages, a demand for labour constantly greater than the supply, a state of affairs will arise in which, without special restraints, the level of wage rates, and hence the level of prices, will continually tend to rise. A second danger is that conditions may be created in which it will be difficult to get the appropriate number of men into the appropriate jobs without resorting to the direction of labour; and a third danger is the possible emergence of a deficit in the balance of payments. Professor Robbins sees clearly that with money incomes tending to rise, imports will be stimulated while exports are likely to be discouraged by the pressure of domestic demand and rising costs. He does not believe that a cure can be found in a régime of rigid administrative import controls, but on this point he does not go quite as far as *some* economists on the continent of Europe, who hold that such controls are of practically no use, their argument being that if increased imports are permitted they will absorb a part of the domestic purchasing power, which will set goods free for increased exports—so that imports lead to exports, a conclusion which, it must be added, has been borne out by the actual experience of several countries.

It is not possible in a brief review to give even a vague idea of all the problems dealt with by Professor Robbins—ranging from the dollar shortage to the advantages of the Atlantic Community as compared with other possible groupings of power. After all the attention which, following the publication of *The General Theory* in 1936, it became fashionable to devote to the tendencies in a closed economy, it is salutary to find an author who not only never forgets the international implications but obviously gives much thought to problems of international trade and payments. Keynes' name occurs again and again—but even when Professor Robbins clearly disagrees with some of Keynes' statements he is anxious to explain what was in Keynes' mind and what may have been the reason for his errors.

In his article on " The Dollar Shortage " the writer discusses the famous forecast made by Keynes in his posthumously published article in the *Economic Journal* for June 1946 that " the chances of the dollar becoming dangerously scarce in the next five or ten years are not very high ". Professor Robbins points out that if this forecast is in manifest contrast with facts it is not so much because Keynes was mistaken about America's becoming a comparatively " high-living, high-cost country "—for this is still one of the main grounds for optimism regarding Europe's economic relations with the United States—but because he failed to realise that the deficit countries would continue for so long their inflationary methods of financing, Keynes being, as Professor Robbins says, " temperamentally inclined to underestimate the probability of inflation ".

In the article " Towards the Atlantic Community " Professor Robbins lays down as a broad proposition that the main forms of European economic co-operation, which have been proposed in connection with integration, involve European political union as well if they are to be carried to any lengths. It is clear, however, that he does not really believe that such a union would prove acceptable, even to the continental countries, and he is positive in declaring that, in any case, under no condition could Great Britain agree to join a union of this kind. But he sees an alternative solution on the basis of the Atlantic Pact, a grouping which he thinks may provide a safeguard for peace and prosperity for as many years as it is reasonable to look ahead. These views were expressed in a paper published in July 1950 in *Lloyds Bank Review*—and it must be a source of satisfaction to Professor Robbins to find that what happened in 1954, when the proposal for a European Army was turned down and a new arrangement agreed to under which western Germany is to enter N.A.T.O., was very much in line with what he wrote and hoped for.

Statements occur here and there with which the present reviewer cannot fully agree (e.g. Professor Robbins' definition of a " dollar shortage ", which seems to include a shortage arising from factors other than those *specifically attributable* to the particular conditions prevailing in that great country, the United States). But Professor Robbins' good sense never deserts him under any circumstances. With regard to the price of gold, he thinks that an increase in the official price is " a proposal which deserves to be taken seriously ", but he finds that the attitude of public opinion in the United

States may easily present an insurmountable obstacle for some years to come and that therefore " to let too much depend on the prospect of a rise in the price of gold would be to risk much disappointment ". For those who wish to understand the most interesting and important tendencies in present economic and financial thought of a liberal bent, Professor Robbins' book forms a most valuable guide.

Now and then one comes across a statement which has the appearance of a rather pontifical pronouncement; but on the whole these lectures reveal in their author a more modest attitude towards the difficult problems confronting the world than one usually meets in current economic literature.

PER JACOBSSON.

History of Economic Analysis. By J. A. SCHUMPETER. Oxford University Press, New York. George Allen & Unwin Ltd. 1954. xxv + 1,260 pp. 124s.

Economists in general, and historians of economics in particular, have long awaited the publication of the late Professor Schumpeter's monumental *History of Economic Analysis.* Ever since the appearance of his *Epochen der Dogmen- und Methodengeschichte* in 1912,[1] he had taken a direct interest in the history of economics, and the present volume is the outcome of a lifetime's thought, research and teaching.

Drawn on an ambitious scale, the *History* is designed to portray " the Filiation of Scientific Ideas—the process by which men's efforts to understand economic phenomena produce, improve, and pull down analytic structures in an unending sequence " (p. 6). But while this statement accurately describes the purpose of the volume, in executing this purpose Schumpeter ventures far beyond the limits of economic analysis *per se*, and this feature effectively " individuates " the performance. For each of the four periods considered—Part II, The Beginnings to 1790 (325 pp.); Part III, 1790 to 1870 (371 pp.); Part IV, 1870 to 1914 (and later) (382 pp.); and Part V, Conclusion, a Sketch of Modern Developments (45 pp.)—a conscientious attempt is made to paint the " Intellectual Scenery " and the " Socio-Political Background " and to outline the main historical events affecting economic thought. In addition Part I deals with Scope and Method (pp. 3–47), touching upon the Techniques of Economic Analysis, Contemporaneous Developments in other Sciences, and the Sociology of Economics.

The distinctive features of the *History* are demonstrated in Part I, where Schumpeter presents the conceptual skeleton that is to be clothed in the subsequent pages. Few, if any, economists were better equipped to display the historical development of economic analysis against such a broad background of ideas and events, and while the historical sketches are inevitably terse and somewhat over-simplified, they invariably illuminate the main story and arouse the reader's respect and admiration for the author's immense scholarship.

The work bears throughout the unmistakable stamp of Schumpeter's personality to an extent recalling the Wesley Mitchell *Lecture Notes*, published in 1949. The personal element is present not only in the characteristic verbal felicities—such as the references to " methodological hypochondria "

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[1] Recently translated by R. Aris, under the title *Economic Doctrine and Method.*

(p. 534), Roscher's " fricassee " (p. 741), Wagner's " rabies systematica " (p. 851), and to Dupont de Nemours' talents as " those of the pianist and not those of the composer " (p. 226)—and in the way that the reader is taken into the author's confidence, but also in a deeper sense. Schumpeter claims that whereas " there is no objective meaning to the term progress in matters of economic or any other policy " (p. 40), progress in scientific economics is clearly identifiable; yet he concedes that in making " evaluations of analytic quality " value judgments are both " permissible and unavoidable in a history of scientific economics " (p. 348).

These personal evaluations are evident in his comments on the nature of scientific achievement. In no other history of economics have such effective methodological distinctions been drawn between the various aspects of scientific work. " Low standards of rigour and sloppiness of thinking have been worse enemies of scientific economics than has been political bias " (p. 233), he says, adding that confusion between the scientific and ideological features of a given performance has frequently prevented the recognition of analytic merit. Mere technical skill is not enough, for " precisely the strongest achievements in science proceed not from observation or experimentation and orderly logic-chopping but from something that is best called vision and is akin to artistic creation " (pp. 113–4). Absence of vision or " lack of imagination ", he asserts, is " much worse than defective technique " (p. 684), and by contrast with the classical economists, whose theory of economic development suffers from " a complete lack of imagination " (p. 571), Marx's vision of the economic process receives high praise.

The most important contribution a theorist can make to the advance of scientific economics is through his perception of system. " This all-pervading interdependence [of economic phenomena] is the fundamental fact, the analysis of which is the chief source of the additions that the specifically scientific attitude has to make to the practical man's knowledge of economic phenomena. . . . The history of economic analysis or, at any rate, of its ' pure ' kernel, from Child to Walras might be written in terms of this conception's gradual emergence into the light of consciousness " (p. 242). This explains Schumpeter's verdict that Walras is the greatest of all pure theorists; and it also accounts for the importance he attaches to the Cantillon-Quesnay model of the economic system.

On general matters of interpretation, the passages most likely to provoke controversy in this country are those dealing with British economic thought since 1776. The overall picture which emerges will, however, be no surprise to readers familiar with Schumpeter's earlier writings. The spotlight is directed away from the established stars—especially Smith and Ricardo—towards some of those usually regarded as supporting players. Schumpeter clearly demonstrates the extent to which the *Wealth of Nations* is an 18th-century product, maintaining that it " does not contain any single *analytic* idea, principle, or method that was entirely new in 1776 " (p. 184). Due acknowledgment is paid to Ricardo's " priceless gift of leadership " (p. 473), and to his " engine of analysis " as a " decisive advance " (p. 474), but two major weaknesses are stressed in an endeavour to reduce the analytic importance of his contribution to its " proper proportions " (p. 475). The first, termed the " Ricardian Vice ", refers to " the habit of piling a heavy load of practical conclusions upon a tenuous groundwork, which was unequal to it yet seemed in its simplicity not only attractive but also convincing " (p. 1171), and this, when reinforced by the " Art of Triviality . . . leads the victim, step by step, into a situation where he has got either to surrender or allow himself to be laughed at for denying what, by the time that situation is reached, is *really* a triviality " (p. 653, n.). The second defect is called the Ricardian " detour ", an expression reminiscent of Jevons' famous indictment. Schumpeter contends that Ricardo led his followers away from the more profitable study of " the problem of distribution as a problem of valuation " and " the factors that explain the size and rate of change of the Social Product " (p. 568) to a study of the " labour-quantity theory of value " (p. 560). Moreover, he adds that this implies " that Ricardo was completely blind to the nature, and the logical place in economic theory, of the supply-and-demand apparatus and that he took it to represent a theory of value distinct from and opposed to his own. This reflects little credit on him as a theorist " (p. 601).

These are grave charges which will inevitably provoke discussion. Here it must suffice to say that Schumpeter's estimate of the continental utility-distribution analysis and its British exponents is in full accord with recent research. Although personal evaluations play a part, there is ample evidence of Schumpeter's readiness to acknowledge a wide variety of contributions. Economists specially commended include Serra, Misselden, Botero, Galiani, Turgot, Cournot, Moore, and Fisher. Ricardo's immediate supporters emerge with credit, John Stuart Mill's reputation is enhanced, and Marshall's greatness as an economist is generously praised. Leaders of the Austrian School, on the other hand, are severely admonished for the technical inadequacies which led them up blind alleys (pp. 916–7), although Böhm-Bawerk's errors are treated somewhat indulgently.

Schumpeter's treatment of mediæval literature merits special attention, for it far surpasses any previous examination of this period in histories of economics. To Marshall's remark that " it is all in A. Smith ", Schumpeter is tempted to reply " it is all in the scholastics " (p. 309). It may justly be said that he draws too freely upon the wisdom of hindsight, and he sometimes expresses unnecessary surprise at the slow development of suggestive ideas. But he draws a fruitful distinction between " objective " and " subjective " originality in the works reviewed.

On first acquaintance Schumpeter's *History* may disappoint professional economists. The pedagogical purpose of the volume (p. 4), however, explains its textbook characteristics, the " exercises " provided for the reader, and the " jejune " quality of some of the explanatory comments. It might be said that the book is designed for an unusually learned undergraduate. If the theoretical discussions lack novelty it is partly because Schumpeter's views are well known, and partly because he relies heavily on previous studies by established authorities, such as Cannan, Hayek, Marget, Stigler, and Viner. In the text he frequently glosses over difficulties, sometimes elaborating them in footnotes but often failing to dispose of them adequately. This is the price paid for the extensive background material, and to some readers it will appear excessive. The volume is either too short or too long, depending on the point of view.

In conclusion, a tribute must be paid to the magnificent editorial task performed so devotedly by the late Mrs. Schumpeter and her eminent collaborators. Some imperfections were inevitable. The indexes and cross-references are inadequate; there are a few misprints and minor inaccuracies; and the different kinds of type are occasionally misleading. But these deficiencies are too slight to detract significantly from the volume as a whole. It is an outstanding memorial to Schumpeter's career, and will long remain a classic.

A. W. COATS.

Migration and Economic Growth. By BRINLEY THOMAS. Cambridge University Press. 1954. xxv + 362 pp. 42s.

The emigration to the United States of 30 million Europeans in less than a century is a theme that has been strangely neglected by economists. More even than the export of capital, it was the movement of men across the Atlantic that transformed the modern world and changed its centre of gravity. Yet there has been until now no adequate study of this displacement of population from the Old World to the New, assembling the statistical data, analysing the economic forces that were called into play, and reviewing the problems of policy involved.

In approaching this theme, Professor Thomas has concentrated on the two countries that have successively taken the lead within the Atlantic community: Britain and the United States. He glances from time to time at the Dominions on the one hand (especially Canada and Australia) and at the countries of the European continent on the other (especially Sweden, Germany and Italy). But it is the ebb and flow of labour and capital in and between the two leading countries over the past century that chiefly engages his attention. He shows how, while the economies of the two countries moved in parallel in the days before the first great surge of migrants in the late forties and after emigration had subsided in the inter-war period, the years between were characterised by rhythms of development inverse to one another. This inverse relationship shows itself most strikingly in the swings of the building cycle in the two countries, these swings reflecting " minor secular booms " in migration from one country to the other. Professor Thomas explores the mechanics of these secular movements in some detail, treating them as symptoms of uneven rates of growth in the parts of the Atlantic economy, and arguing that, for Great Britain at least, the secular swings imposed a common rhythm on foreign investment, employment, imports and real income per head as well as on emigration and home construction. He also detects a secular break in the forces governing the rhythm of growth in the late sixties, the lag of railway-building in America behind immigration being reversed after the civil war.

This main thesis is surrounded by others that are less elaborately worked out. For example, Professor Thomas believes that the timing of the cycles of immigration was determined largely by a births cycle in Europe and that the ups and downs of fixed capital investment in America were " propelled by the expansive influence of periodic inflows of population ". He relates the development of techniques of mass production to these inflows, and finds evidence for his thesis in the fluctuations in patents granted for inventions in the United States between 1839 and 1913. He associates a rapid increase in real income in Britain with a high level of home investment and goes on to deduce that a great opportunity was missed at the beginning of this century because Britain invested heavily abroad instead of taking advantage of contemporary " innovations in electricity and chemistry ". He regards the limitation of immigration into the United States after the first World War as an important factor in bringing about the slump of 1929. He argues that these restrictions originated to some extent in the increasing social stratification of the country and that it was the greater competition that British immigrants had to meet that made them veer away from the United States after 1900.

All this is extremely stimulating and a valuable contribution to our understanding of the economic forces that have dominated the growth of the world economy over the past century. Yet I have found myself again and again dissenting either from Professor Thomas's conclusions or from the evidence by which they are supported. Each of the subsidiary theses that I have listed seems to me open to qualification or doubt.

Is one really expected, for example, to take the births cycle seriously? Does it explain either the outflow of Irish and Germans around 1850, of the English in the eighties, or of the Italians after the turn of the century? If the secular swings were themselves of about twenty years in length, may not a births cycle of about the same length have been set up by emigration rather than the other way round? If there was a secular break about 1870, does this not imply a change in the relative strength of "push" and "pull" inconsistent with any theory in terms of birth cycles? I find it difficult to understand why, at this point in his argument, Professor Thomas uses data for Europe (and data relating to natural increase, not births) rather than for the United Kingdom.

An explanation of the secular swings must surely be sought mainly on the side of developments in America. But here Professor Thomas is handicapped by the lack of an analysis of the fluctuations in American investment. Even at the level of statistical data, it is most unsatisfactory to have to make do with figures of additional mileage of railway track as an index of capital expenditure by American railway companies. If the American economy made the running, what made it run? I should have thought that here, as at other points in the analysis, it was necessary to look at the terms on which America could produce and exchange primary produce and the impediments to an extension in her agricultural output. But this is largely left out. There is no hint, except in a quotation from Keynes, that the time had come round by the middle nineties for a push to expand the frontiers of natural resources elsewhere than in America, that there had then to be a readjustment of the exchange value of agricultural produce, and that this readjustment would carry with it a sharp increase in the marginal productivity of capital and a strong inflationary impulse. Without this clue, we can make nothing of the switch of British foreign investment to Canada and the other Dominions, of the falling off in migration from the English (and Irish) countryside, of the rise in profits and the fall in real wages—a fall not confined to Britain. We readily adopt instead the theory of the lost opportunity.

Was an opportunity lost? If Britain had not accelerated the development of Canada after 1900, would she have enjoyed such favourable terms of trade after 1920? If the export of capital had been checked, how many extra power stations or chemical works would have been built? British neglect of scientific innovation was not due at the beginning of the century, any more than it has been due since, to the high cost of capital. It is arguable also that much of the capital that was exported was accumulated out of the houses that no longer required to be built because of emigration and that investment *in British industry* suffered little, if at all.

It is difficult also to accept without reservation the thesis that it was cheap labour that gave us mass production. If so, why did mass production techniques not originate in the countries from which the emigrants came and why have they been so slow in spreading to those countries? Similarly, while Professor Thomas's discussion of the social ladder in the United States is new and illuminating, it does not appear to establish a growth in social stratification so long as immigration was in full spate. Was the America of Theodore Roosevelt more highly stratified than the America of Madison? Or must we leave the negroes out of account? If, finally, one examines the statistics carefully, was there such a marked veering away of British migrants from the United States in the first decade of this century? If we take migrants from Great Britain only, it would seem that about as many found their way to the United States in that decade as in any other; if there were fewer labourers among them, this is to be explained as much in terms of the replacement of rural by urban migrants as in terms of the check to American real wages.

Even Professor Thomas's main thesis seems to require some qualification. When we find him using 9-year moving averages that show the years of maximum unemployment before the first World War falling in 1881–83, we may reasonably entertain some suspicion of his conclusion that high unemployment went with high foreign investment. Equally we should beware of the suggestion that national income and wages moved up fastest in periods when home investment was at its peak. If we can trust Professor Bowley and Mr. Prest, the maximum period of growth in real wages and national income per head lay between 1883 and 1890—they put the increase at about 30 per cent. in seven years, and both were years of boom. But this was a period of active foreign, not home, investment. Similarly, if we take the building boom of the seventies, home investment grew rapidly but national income per head rose very little. As in many other analyses of this kind, one begins to ask oneself whether the notions of trend and deviation from trend are not being submitted to more pressure than the logic of history will ordinarily sustain.

I have one last grumble. There is, no doubt, a tropical splendour in the lush growth of tables and diagrams that crowd the book. But even a little Indian blood is not always enough to guide the explorer through them. More than once, Professor Thomas himself seems to find the trees too thick around him to see the wood. For example, at pages 78–9 he concludes that there has been a relatively heavy outflow of young women from Eire for many decades; says that the opposite was true from about 1855 to 1893; and claims that at least among emigrants aged 15–19 females exceeded males from 1861–1910. Yet Tables 20 and 22, printed almost alongside this passage, show that all of these statements (which presumably rest on Table 90) are incorrect.

Clearly, there is plenty to arouse the reader, sometimes to disagreement but more often to fresh trains of thought. Professor Thomas has started many hares and those who chase them in his company will have an exciting time and enjoy a commanding view.

A. K. CAIRNCROSS.

Economic Growth and Human Welfare. Three Lectures. By E. H. PHELPS BROWN. Ranjit Printers and Publishers, Delhi. 1953. 55 pp. R. 1/4. 3s. 6d.

Professor Phelps Brown's *Economic Growth and Human Welfare* combines an unpretentious brevity with depth of thought. The topics treated by it are long-cultivated ground, but the author's angle of approach enables a familiar landscape to be seen in a novel light. He writes as a humane economist aware that the problems discussed by him relate, not only to material well-being, but to quality of life, and that to formulate them in exclusively economic terms is to beg the questions most in need of a reply. Naturally, he does not attempt in three lectures to unravel all their windings; but he brings to them an unassuming subtlety and insight which makes his fifty pages more illuminating than not a few more ponderous tomes. The first accomplishment required by a student of social affairs baffled—as who, at times, is not ?—by an inability to see the wood for the trees, is also the most difficult to acquire. It is a capacity to disentangle essentials from the crowd of irrelevant complexities in which, as first presented to him, they are normally concealed. He could desire no more convincing lesson in that difficult art than that offered by the book of Professor Phelps Brown.

The first chapter is historical. It discusses the forces which have converted man's struggle with nature from the guerilla war of petty skirmishes which during the greater part of history it has been, and which in most regions it remains, into the systematic, highly capitalised attack which in modern economic civilisations it has become. The feature which he selects for emphasis is psychological. It is first the emergence, and next the wide diffusion, of a specialised human type characterised by the " business-like " qualities of unremitting industry, reliability, and a capacity for intensive concentration on the search for ever more efficient means to ends. Speculations whether circumstances evoked the character, or the character created the conditions needed to enable it to function with effect, are sterile; but two observations may be permitted, with neither of which, perhaps, would the author disagree. The first is that, granted the indispensability to any large-scale economy of the characteristics depicted by him, a distinction may with advantage be drawn between the qualities in question and the particular systems of organisation within which they perform their tasks. Experience suggests that the former have flourished under institutional arrangements of more than one kind. Is there more reason to suppose that energy, honesty and assiduity will wither if the area governed by those today prevalent in the west contracts than that, for example, the cessation of private wars conducted for the pecuniary gain of military *entrepreneurs* involved the disappearance of other human qualities, such as courage and a capacity for endurance ? The second comment is equally trite. It is that, since the needs requiring satisfaction are diverse, the economic virtues, however necessary in their place, do not provide an all-sufficient formula for social health; that, if often good servants, they are always bad masters; and that the evils caused by their hypertrophy can be as gross as those arising from their neglect. The cogency of the gospel of work depends on the purpose which the work in question serves; and the idolatry of means without regard to ends is not a virtue, but a vice. The problem, it may be suggested, is not merely to allow the propensities underlined by the author a reasonable scope in the spheres in which they can be useful, but to restrict their action to them.

Capitalism—to use the conventional short-hand—is not only an economic device, but a form of civilisation. Once the obvious inhumanities of its youth have been mitigated or removed, it is in the latter aspect, as well as in the former, that it is the target of attack. These considerations have some relevance to the social discontents discussed in Professor Phelps Brown's second chapter. Here, again, he lays his heaviest emphasis on psychological rather than economic factors. His dismissal of the latter in his remarks on denunciations of profit-making and on the exaggerated claims, as he thinks them, advanced for the effectiveness of trade unionism in raising wages is, perhaps, a little summary. Obviously—to refer only to the second point—productivity is fundamental; but, if one cannot get more than a pint out of a pint-pot, one can easily get less. To one who has observed the improvement in standards of life resulting from an increase in remuneration secured, after long delay, either by trade union pressure or, in the past, by legally enforced minimum rates, his application of the soothing title " economic friction " to the determined opposition which prevented the salutary change from taking place before seems a trifle unrealistic.

On the other hand, the author's treatment of the less-noticed, but equally or more important, psychological causes of social disillusionment and exasperation is forcible and convincing. The " developed economy ", he argues, has greatly increased income per head, but has also produced three other results which go far to neutralise the satisfaction accruing from more money to spend. It has dissolved the communities based on neighbourhood, in which individuals formerly found shelter, reassurance and support, and has left the latter isolated in a world of impersonal forces beyond their power to control. It has deprived large numbers of them of the enjoyment derived from work which, if not creative, was spontaneous in the sense of being at a pace and in a style in accordance with individual tastes, and the results of which bore the stamp which the worker gave them. It has submitted the mass of mankind to a discipline imposed from above, for ends which are not theirs, by authorities accountable neither to them nor to the public, but to shareholders interested only in the pecuniary returns which the labour of employees can be made to yield. The result, the author suggests, is a state of morbid tension occasioned by two conflicts. The first has its source in the collision between a traditional code of social conduct based on the contact of man with man in the smaller and more intimate communities of the past and the depersonalised relations of the modern industrial machine. The second consists in the contrast between the rights and responsibilities of the worker as citizen and the smaller share of either possessed by the citizen as worker.

Professor Phelps Brown remarks that an individual may suffer from malnutrition without knowing either the nature of his trouble or the vitamins which would put it right. His attitude to conventional programmes, Socialist and other, reflects that view. They carry conviction, he thinks, because they lay their finger on maladies—the helplessness of the individual worker or the economic egotism of the profiteer—of which those to whom they are addressed are acutely conscious; but, while skilful in diagnosing ailments, they are apt to be less successful in prescribing remedies for them. Educational reforms and the combined effects of steeply graduated taxation and the extension of the social services have, in his view, made nineteenth-century theories of an inevitable class conflict in this country out of date. Undoubtedly he is right in thinking that certain kinds of inequality have diminished; but there is a long road still to travel before, even in the educational sphere, equality of opportunity becomes a fact; while economic inequalities of the kind epitomised in an ex-Chancellor of the Exchequer's recent statement, which appears to have passed unchallenged in the House, that approximately half the nation's wealth is owned by 1 per cent. of the population, continue to be gross. Nationalisation, again, has neither been the failure confidently prophesied in some quarters nor the dawn of a new era foretold in others. To the author's, on the whole, not unfriendly comment on it might be added a regret that the opportunity which public ownership offers of working out, by experiment in particular plants, a new pattern of industrial relations appears as yet to have been missed. Of the conclusions suggested by *Economic Growth and Human Welfare*, the most important can be simply stated. It is that the traditional specifics of reformers require to be reconsidered in the light of a more realistic and discriminating analysis of the causes of social *malaise* than has hitherto been made. No one is better qualified to undertake such a revision than Professor Phelps Brown.

R. H. Tawney.

Monopoly and Competition and their Regulation. Edited by E. H. Chamberlin. Macmillan & Co. Ltd. 1954. xvi+549 pp. 36s.

This volume is the outcome of the Round Table meeting of the International Economic Association held in Talloires in September 1951 ; it contains the papers given to the assembled group of experts and a summary record of the discussions prepared by Mrs. Elizabeth Henderson.

The contents fall into two parts. First, there is a series of eight papers on Monopoly and Competition in Canada, France, Italy, South Africa, the United Kingdom, the United States, Western Germany, and Scandinavia. To this one may add a paper by F. A. McGregor, the former Canadian Combines Investigation Commissioner, on Canadian techniques of preventing monopoly. Together these essays are likely to be the most useful part of the volume. They describe, in so far as the data permit, the extent and nature of monopoly in the countries and the measures taken to deal with it, and interesting side-issues, such as H. Brems' short discussion of some aspects of competition between private monopolies and consumer co-operatives, are included here and there. The main regret is that each author was asked to cover so much ground in so little space ; a more equal allocation of the available space between the country studies and the material in the rest of the book would have increased its total utility. As it is, the treatment tends to be cramped. One can imagine the difficulties R. B. Heflebower must have had in condensing the mass of available material and accommodating the numerous interesting topics, economic and legal, about monopoly in the United States within 28 pages ; nevertheless, his essay is most useful. What the volume might have looked like can be judged from the two essays on Canada, respectively by V. W. Bladen and F. A. McGregor, taking up 40 pages. Together they provide an admirable survey of interesting material. G. C. Allen gives a fact-laden account of the development of competition and monopoly in this country, taking the story up to the appointment of the Monopolies Commission. The essay on South Africa by W. F. J. Steenkamp is well done. But it is a pity that he did not give more details of the effects of the limited application of the legislation of 1931 and 1949 ; the " experiments " may have lessons for anti-monopoly action elsewhere. The country studies are rounded off by a paper on " Issues in the Monopoly Problem " by Corwin D. Edwards, formerly of the American Federal Trade Commission, which ends up with three pages of key questions.

The rest of the essays are largely theoretical. If the reader expects much in the way of revelation or innovation from them, he will be disappointed. The analysis of the basic problems of monopoly or competition is not taken further than before or given a new direction. And the points on which there were differences of opinion and judgment among those participating in the Round Table are the familiar ones. Nevertheless, several of the papers are rewarding. My own list would include the following, in order of their appearance in the book : K. Rothschild's provocative but helpful classification of " The Wastes of Competition " ; F. Machlup's stimulating discussion on " Monopoly and the Problem of Economic Stability " ; P. Hennipman's thorough and clear survey of views and data pertaining to the effect of monopoly on economic progress ; and W. A. Lewis's characteristically forthright comments on " Recent British Experience in Nationalization ". Apart from these, it is always of interest to read contributions in this field by economists such as J. S. Bain, Mrs. J. Robinson and E. H. Chamberlin or by Continental experts whose writings are not well known over here.

The " Summary Record of the Debate " suggests that the discussions were brisk. But the outsider who is given these glimpses of the proceedings is not able to get much from them. In places it is like overhearing snatches of conversations, which, if heard in their entirety, may well have been more interesting or instructive. Though this is not intended as a criticism of the *rapporteur*, whose object was " to present the general balance of debate rather than refinements of discussion on detailed issues ", the omission of the fifty-page summary would not have been a serious loss.

B. S. YAMEY.

Readings in Business Cycles and National Income. By ALVIN H. HANSEN and RICHARD V. CLEMENCE. W. W. Norton & Co. Inc., New York. George Allen & Unwin Ltd. 1953. xi + 588 pp. $3.95. 30s.

This is an extraordinarily interesting and well balanced collection of writings on economic dynamics in the broad sense. It begins with four chapters in which historical episodes or periods are surveyed by recent writers in the light of modern economic analysis—the commercial crisis of 1847 by Mr. Ward-Perkins, the Great Depression (of the late nineteenth century) by Professor Rostow, the 'twenties in the United States by Schumpeter, and the 'thirties by Professor Smithies. These are excellent examples of what may be called the new economic history; no sixty pages could be better calculated to suggest to the historian that economic analysis has something to offer him, or to the theorist that the test of theory is its application.

The next, longer, section on business cycle theories ranges widely, from Mill and Jevons to Professor Robertson, taking in passages from (among others) Spiethoff, Cassel, and Aftalion on the way. These readings may be regarded as illustrating the development of the main concepts of modern trade cycle dynamics—the downward-sloping schedule of the marginal efficiency of capital, the acceleration principle, the multiplier, the lags of adjustment which lead to the " cobweb-type " theories of Professor Hawtrey and Cassel. The systematic combination of these concepts is in the main left until later in the book.

The next section, called " Economic Dynamics ", deals first with that particular combination of the multiplier and the acceleration principle which Mr. Harrod applied, not so much to the explanation of the trade cycle as such, as to the investigation of the conditions of stable long-term growth. His original article is followed by three reviews of his *Towards a Dynamic Economics*, including that in which Professor Hicks adumbrates his own trade cycle theory. This is followed by Mr. Knox's review of Professor Hicks' theory, and the section, perhaps rather surprisingly for one which has been mainly concerned with the Harrodian dynamics, concludes with Professor Metzler's inventory cycles.

It is a little hard to see what is the unifying principle of the section entitled " Econometrics ". The famous methodological discussion between Keynes and Professor Tinbergen and the latter's critical remarks on business cycle theories in the light of his econometric work clearly fall under the heading conveniently, though for different reasons ; so, as a specimen of the econometric art, does Professor Einarsen's chapter on reinvestment cycles. Professor Metzler's review of Burns and Mitchell's purely empirical approach also comes in here. It is, however, less clear why Mr. Kaldor's theory of the trade cycle should be brought in at this point ; it belongs, surely, like Professor Hicks' theory, to the small family of almost purely theoretical writings in which the main concepts discussed in the second section of this book are combined in a rigorous model.

The section on international and interregional aspects of the trade cycle is refreshingly out of the ordinary, combining as it does the excellent League of Nations account of the international spread of booms and depressions with two American studies of regional and interregional cyclical questions which (in this country at any rate) are much less well known. The next section, on long cycles, consists of two valuable contributions which, also, are probably much too little known to British economists, if only from the circumstance that they appeared in the *Review of Economic Statistics* during the war.

The final section deals with trade cycle policy. Apart from Mr. Kaldor's famous article of 1938, all the readings included here are American. Perhaps this is natural and inevitable ; perhaps it is only by (or on behalf of) Americans that trade cycle policy is regarded as a prime matter. At all events, American policy with regard to the cycle is certainly an important enough matter for the whole world.

It should be added that the value of this book is very markedly increased by the short introductory notes to each of the readings, which both give indications of the main line along which it is thought to contribute to the subject, and serve to introduce the author. The editors have done their work excellently in this, as they have in the main task of selection.

A. J. BROWN.

The Dollar. By ROY HARROD. Macmillan & Co. Ltd. 1953. vii + 156 pp. 9s. 6d.

In these Sir George Watson lectures, Mr. Harrod has provided a useful and entertaining account of the dollar as an American " institution ". The first lecture describes the development of American currency and banking up to the beginning of this century ; it is necessarily a highly summarised account, but brings out the weakness of the sytem in the absence of a central bank—a weakness which, nevertheless, interfered surprisingly little with the economic development of the country. It also reveals Mr. Harrod as a mild partisan of bimetallism. The second lecture deals with the origins of the

Federal Reserve System, and its history to the present. The most interesting features of this lecture are, perhaps, Mr. Harrod's personal recollections of the circumstances which prevented the Federal Reserve Bank of New York from making massive open-market purchases in the autumn of 1930, and his statement of the case for the revaluation of gold, both in 1933 and now.

The third lecture deals with the dollar as an international currency. Mr. Harrod is able here to give a considered view of the State Department policy on discrimination ; its roots (which to many people have always been rather mysterious), and the wisdom or unwisdom of its particular application in the Mutual Aid Agreement. The virtues and limitations of the Fund and the Bank are also discussed, though it is perhaps a little surprising that the author does not give more attention to the deficiency of the scale on which they were conceived.

The final lecture deals with the dollar gap. The question of gold revaluation comes in again here, but perhaps the chief topic is the sterling devaluation of 1949, Mr. Harrod's view of which does not become more favourable with the passage of time. That the conditions of the time were unfavourable to the success of the policy cannot be denied, but a good deal remains to be said on the other side—apart from the question whether there was in fact a practicable alternative. A mechanical application of purchasing power parity may be misleading when what is required is a large change (as compared with pre-war) in the balance of trade. It is, moreover, as Mr. Harrod says, difficult to disentangle the inflationary effects of devaluation from those of the Korean war, and many people will think that too much is attributed to the former and too little to the latter.

Altogether, economists will find plenty to discuss in these lectures. Whether the lay reader will be sufficiently helped by Mr. Harrod's concessions to him is more doubtful.

A. J. BROWN.

L'Europe sans Rivages. By FRANÇOIS PERROUX. Presses Universitaires de France, Paris. 1954. vii + 688 pp. Fr. 1,800.

In this extensive study, Professor Perroux subjects to penetrating criticism the philosophy and projects of the advocates of Western European economic integration, and puts forward his own approach to international economic relations. The first part of the book compares the development and relative economic strength of various leading countries in modern times, and discusses the difficulties which have been created or intensified for Western Europe by the emergence of the United States and the Soviet Union as dominant economies. What is the future of Western Europe, sandwiched between these dominant economies ?, asks Professor Perroux.

He emphatically maintains that the welfare of the peoples of Continental Western Europe does not lie within the restrictive framework of nation states; nor can it lie within that of any continental bloc resulting from the federal or the functional approach to economic integration. His basic thesis is that the real interests of Continental Western Europe, like those of Britain, are best served by the strengthening of trade ties with as much of the world as possible. This approach is vital, argues Professor Perroux, because the natural economic space of Western Europe, or the space which is relevant to the plans of governments and firms, lies to a great extent beyond her maritime frontiers. Economists will be particularly interested in the author's account of his concept of economic space.

Professor Perroux looks forward to the participation by the countries of Western Europe and other advanced economies (which, he emphasises, originated in European technology, capital and manpower) in internationally prepared schemes for an expanding world economy achieved through the development of economically backward countries. This form of international activity, while constituting a great humanitarian enterprise, would enable Western Europe's actual and potential productive capacity to develop within its natural economic space.

The central thesis is supported by a wealth of analysis and information, the very abundance of which tends occasionally to blur its outline, but which cannot fail to impress the reader with the author's insight into many controversial issues. One point which he might have made more explicitly is that the success of his own approach depends not only on the continued willingness of the United States to pursue a liberal trade policy and to assist the financing of under-developed countries, but also on the willingness of the latter countries themselves to avoid unreasonable economic nationalism.

W. ROBERTSON.

World Population and Production. By W. S. and E. S. WOYTINSKY. Twentieth Century Fund, New York. 1953. lxxii + 1268 pp. $12.

This is the first of two volumes, in which the authors plan to present a panorama of the world's economy as a whole. The present volume has five parts. Part I: " Man and his Environment ", offers a broad survey of world population distribution and problems in the light of prevailing physical and social conditions; Part II: " World Needs and Resources ", surveys consumption habits and standards of living and the utilisation of natural and human resources. The third part is devoted to world " Agriculture ", the fourth to " Energy and Mining ", while in Part V, " Manufactures ", special treatment is given to the Food and Drink, Textile, Iron and Steel, Machinery and Transportation Equipment and Chemical Industries. Tremendous energy has been given to the compilation and careful sifting of information on this wide variety of topics from an abundance of sources—the list of references alone occupies not less than 37 pages and will be valued for its own sake. There are no less than 497 statistical tables and 338 charts and maps. Ingenious use is made of a new map projection by Erwin Raisz to depict world patterns of social and economic activity.

In a volume of such wide scope it would be remarkable if the authors were entirely happy in their treatment of every section and it is not difficult to find a number of inaccurate statements of fact, where often the authors have been misled by unreliable sources. Attempts at over-simplification produce difficulties, notably in the section on The Earth, while the authors do not always assess critically the ideas and points of view which they assemble. But care has been taken to include details of recent developments and to bring facts and statistics as near to the present as is humanly possible. As a reference book for students, this will be much used, though it should be read critically.

M. J. WISE.

Economic Processes and Policies. By W. J. Baumol and L. V. Chandler. Harper & Brothers, New York. 1954. viii+690 pp. $5·75.

The authors' intention, as stated in the preface, is to write a textbook which will " equip the student with analytical tools and indicate how they may be applied " to policy problems of " basic and continuing importance ". While there is indeed a plethora of well assembled material here that will instruct every beginner the choice of problems and policies is such, however, that the book is likely to be much more successful in equipping American college students than in teaching their British counterparts.

Part I, " Productivity, Income, and Wealth ", provides useful definitions of these fundamental concepts, discusses briefly and well some of the pitfalls that beset their measurement and describes the process of economic development both in general terms and, in Chapter 4, with special reference to the United States since the beginning of the nineteenth century.

Part II, " Economic Organization and Control ", extends the preliminary outline of the American social framework. The various types of business unit, the functions of competitive markets and the rôle of government agencies in economic affairs—these topics are neatly introduced in turn to build up a concise and well balanced sketch of the economy at work.

Part III, " Income Unemployment, and Inflation ", opens with a straightforward description of the salient features of the trade cycle, illustrated by references to American experience of the past twenty-five years. This is followed by a comprehensive treatment of national income accounting (Chapter 9), an excellent analysis of national income determination (Chapters 10, 11 and 12) and a careful statement of the case for and against flexible wage-rates as a counter-cyclical device.

Part IV, " Monetary and Fiscal Policies ", contains six chapters of which only the last, dealing with budgetary policy, can be said to give a general treatment rather than one limited to the institutions of the American economy. Within this framework, however, the discussion of the money supply and the banking system, the appraisal of monetary policies and the explanation of certain aspects of public finance are thoroughly competent, although the addition of a paragraph on the British banking network would have improved the perspective.

Part V, " Composition of Output, Free Enterprise, and Planning ", discusses the allocation of resources under ideally competitive conditions (Chapters 20 and 21) and describes several aspects of monopoly in the light of anti-trust legislation (Chapters 22 and 23). In the final chapter of this section, the authors examine problems facing the central planner, and provide a plausible but perhaps superfluous *reductio ad absurdum* of rigorously detailed programming with the aid of some simple input-output tables.

Part VI, " International Trade and Finance ", extends the carefully graduated analysis to cover the principles behind international specialisation, the mechanism of foreign exchanges, the relationship between balance of payments problems and full employment policy, and concludes by stating the arguments usually put forward in support of free trade on the one hand and protection on the other hand.

Part VII, " Distribution of Income ", contains one relatively short chapter which poses a number of large questions on redistribution of income by taxation, by farm price supports, and by the machinations of collective bargaining—and discreetly refrains from passing value judgments upon any of them.

Looking at the book as a whole, one cannot but be impressed by the excellent way in which the material is organised and presented, as well as by the remarkably consistent pitch at which the analysis is maintained. Parts III and VI are especially good in this respect. These virtues notwithstanding, when one has finally reached the Graphic Appendix to find relegated to this seventy-five page limbo not only the conventional diagrammatic aids but also a concise verbal exposition of value and distribution theory, one wonders whether Professors Baumol and Chandler have not perhaps written two books : a longish one for the student reading Law, History or Politics, who wants to be informed all about economics, and a shortish one to make him think what Economics is all about.

IAN G. STEWART.

Social Mobility in Britain. Edited by D. V. GLASS. Routledge & Kegan Paul Ltd. 1954. vii + 412 pp. 36s.

This book contains the first main results of the programme of research into the processes of social selection and differentiation at work in Britain which the Department of Sociological and Demographic Research of the London School of Economics has carried out since the war. The importance of the subject both from the point of view of public policy, and from that of sociological theory, is so great that the allocation to this task of a large part of the resources of one of the very few social research organisations in Great Britain which seek to investigate the affairs of the country as a whole is amply justified.

The main assumption on which the enquiry is based is that occupation " holds a central position as a means of facilitating the investigation of social status ". The evidence that is presented demonstrates the ease with which this assumption can be validated ; but it does more than this, because it shows that though it would be absurd to attempt to give an accurate description of the British status system otherwise than in terms of occupation, occupation alone does not provide a sufficiently comprehensive framework for the analysis of the more subtle aspects of the subject. Indeed, the work itself shows how complex the processes are which lie behind the formation of social strata, and even gives us some reason to suppose that the factor of occupation may have been allowed to assume a somewhat unhealthy importance as a determinant of status.

This is, of course, better known to Professor Glass and his colleagues who have been responsible for the researches on which the book is based than it is to the outsider, and they will no doubt continue to explore this field as time goes on. When Professor Glass gives free rein to his thoughts, as he does at the end of the introductory section of the book, he enters an urgent plea for the examination of social mobility in our own society from the point of view of the sense of frustration which may accompany it. If, he argues, occupation creates prestige, then those denied promotion may feel aggrieved, particularly if their upbringing has accustomed them to the standards associated with occupations with a relatively high status, and severe strains may result.

It is plain, as he points out, that " employment in occupations requiring high ability and long training and carrying high status need not be the only means of gaining social prestige; there are other ways of serving the community and there should, correspondingly, be other paths to social prestige ". These are questions of social policy which obviously require further study, and it is to be hoped that they will receive it in his own Department. *Social Mobility in Britain* is, in sum, an excellent introduction to the study of many contemporary social and economic problems, and it will be found to be an indispensable aid both to the planning of courses on social and economic organisation, and to the devising of schemes of research in which problems of social structure are involved.

T. S. SIMEY.

Population Statistics and their Compilation. By HUGH H. WOLFENDEN. University of Chicago Press. Cambridge University Press. 1954. xxiii + 258 pp. 56s. 6d.

This is a revised edition of the author's textbook published 29 years ago, enlarged to include reference to recent work in the field.

The central core—some hundred pages or nearly half the book—is devoted to mathematical aspects of inter-censal and post-censal population estimates, and the actuarial approach to infant and other mortality rates, and life tables. This part of the book is most thoroughly written with an exhaustive bibliography, and the professional actuary or official vital statistician will find no better way of mastering these aspects of his subject than a thorough study of the text and references. The less advanced student, however, may find himself overwhelmed by the completeness of the treatment.

An appendix—" Some Theory in the Sampling of Human Populations "—by W. Edwards Deming occupies a further twenty pages.

The remaining half of the book is devoted to all other aspects of the sources and mathematical treatment of population data and, in consequence, is far less thorough, though it might be defended as adequate for the actuary, for whom the book is clearly written. In fact a demographer, particularly if he has some knowledge of mathematics, will find much of value and interest in this remaining half.

The author has a wide knowledge of the history of census taking and vital registration and, what is less common, this covers both sides of the Atlantic, though he is clearly more at home in North American than in English or European methods and literature. For instance (on page 34), when discussing the common deficiencies in enumerated populations aged 0 and 1, the example given for England in 1931 is taken from an unofficial source. In such a case an official estimate should surely be preferred, since the official statistician has access *inter alia* to unpublished material. An official alternative is in fact available (1931 Census General Report, page 94, not published until 1950), and indeed illustrates better the point involved. Again, the *Guides to Official Sources No.* 2, *Census Reports of Great Britain, 1801–1931*, H.M.S.O., 1951, would seem to be an appropriate reference to include in paragraph 15. Paragraph 159 suggests that the author is unaware that widowhood and widowerhood rates not only can be but are calculated in England and are published in recent Statistical Reviews—Civil Text. One cannot help contrasting this omission in a reference to the basic data with the great pains to which the author goes to avoid the minutest error in the subsequent mathematical treatment of data.

Standardisation of death rates, forecasting of mortality, causes of death and occupational mortality each occupy a section (chapter) but together they amount to barely twenty pages. A section on marriages, births, orphanhood and unemployment occupies only eight pages and is concerned almost entirely with strictly actuarial aspects of the topics, as is the three-page section on Sickness Data.

The remaining section, on The Theory of Reproductivity, explains the paradox of differing male and female reproduction rates in terms of inconsistent mathematical equations of population growth, deriving either from assumptions of unrealistic sex ratios at birth or neglect to make any allowance in marriage rates for the changing unbalance between the two sexes amongst the non-married. This section concludes with a description of the mathematical theory of population growth with which Lotka's name is associated.

N. H. CARRIER.

Economic Stability in New Zealand. By R. S. PARKER, L. C. WEBB, H. BELSHAW, M. J. MORIARTY, H. G. LANG, G. J. SCHMITT, C. G. F. SIMKIN, and G. E. F. WOOD. New Zealand Institute of Public Administration, Wellington. 1953. 146 pp. 13s. 6d.

This book contains a series of papers delivered to a convention of the New Zealand Institute of Public Administration in May, 1953, together with an introduction by Professor Parker summarising the discussion which took place around the general theme of economic stability.

It is sometimes thought that New Zealand has a simple type of economy, mainly dependent on the production of primary produce, and that since it is also a small country its economic problems should not be difficult to analyse. The present book should do away with this line of thought once and for all. It shows that while New Zealand is very dependent on overseas trade, the Government and people of New Zealand are most reluctant to accept the instability of incomes which such dependence usually entails. However, the reconciliation of aspirations towards stability with other aspirations such as full employment, equilibrium in the balance of payments, orderly marketing, economic development and rising standards of living presents no easy problem either in economic theory or in practical administration, and the size of the economy (New Zealand has a population of about two million, increasing rapidly) does not minimise the problem very much.

It is particularly appropriate that the authors include some of New Zealand's leading economists from the universities as well as public servants who have been intimately concerned with the formulation and administration of Government policy in the economic field and who are thereby well acquainted not only with the practical issues of economic policy but also with the political considerations which inevitably enter into any discussion of these subjects. Liaison between the universities and the Government service has not always been very close in New Zealand, and the Institute of Public Administration is to be commended for its efforts to remedy this defect.

It is clear from the book that economic stability is not something which can be achieved in New Zealand without sacrifice, and in particular that its effective administration involves a high degree of control in the economy with consequential rigidities and irritations. There are limits, however, to the extent to which management of the economy is feasible or indeed acceptable to the electorate. The Labour Government which was in power from 1935 to 1949 did much to make New Zealand more like a planned economy but it did not fundamentally alter the private enterprise character of the economy and the National Government which succeeded it is certainly not likely to do so. In these circumstances stability must be sought by a wide range of devices varying from direct price fixation to general monetary policy but at no point interfering intolerably with personal liberty.

Problems of this nature are common to most countries, but New Zealand presents an interesting case study of them and many experiments have been carried out there which may prove to be worth studying by those concerned with similar issues elsewhere. Perhaps the most valuable section of the book is that dealing with agriculture and marketing (a subject which has also been covered in detail in the *Economic Survey of New Zealand, 1954*, published by New Zealand Government). The importance of regulatory measures in this field is world-wide, and an adequate record and discussion of New Zealand's experience with them has been long overdue.

G. D. L. WHITE.

Intergovernmental Fiscal Relations. By KJELD PHILIP. Institute of Economics and History, Copenhagen. 1954. 171 pp.

The problems of intergovernmental fiscal relations are similar enough for international comparisons to be profitable : the main danger for the student is that he may get lost in a maze of facts and figures. It is clear that Professor Philip was determined to avoid this pitfall, and although this book is based on the experience of four countries (Denmark, Sweden, Britain, and the U.S.A.) there is no risk of the reader not seeing the wood for the trees. Professor Philip has in fact set himself the task of assimilating a great deal of factual material relevant to the subject and setting down the general laws and tendencies that can be derived from it by induction.

In view of this it may seem ungrateful to complain that the book is too abstract, but the fact is that discussing this subject in purely theoretical terms does not get us very far. The main difficulty is that although economic factors are always involved in problems of intergovernmental fiscal relations, the decisions are usually more directly influenced by political considerations, and the laws of politics are notoriously less precise than those of economics. Professor Philip is aware of this, for he emphasises at one point that " it is impossible to foretell, from ordinary working economic considerations, based on ordinary economic logic, what will be the result of encroachment on a town council " (pp. 115-6). But in that case, would it not have been wiser to have made the discussion more concrete, perhaps by the inclusion of case-studies ?

Despite this limitation, there is a good deal of interest in the book, including an elaborate classification of state grants to local authorities, a valuable discussion of the ways in which these grants can be paid in order to achieve certain desired results, and a useful analysis of the factors making for administrative centralisation. Professor Philip has an eye for the wider context of a problem, and students of government finance will be refreshed by some of his generalisations.

It is a pity that the author has been so badly served by his translator. The English version is often awkwardly phrased; it is occasionally misleading in its use of terms like "therefore" and "however"; and it contains a surprising number of simple errors in spelling and grammar, e.g.—"the geografically distribution".

A. H. BIRCH.

A Guide to Keynes. By ALVIN H. HANSEN. McGraw-Hill Publishing Co. 1953. xiv+237 pp. 27s.

Alvin Hansen has for long represented the Keynesian point of view in the United States and has done much to elucidate and to develop many of the concepts and some of the underlying philosophy. He has not been an uncritical Keynesian and for this very reason his work has had much value. It is therefore with pleasurable anticipation that one comes to his *Guide to Keynes*, the purpose of which is *not* to provide a new textbook as such, but to induce the student to read Keynes' *General Theory* for himself and to assist him in his understanding. Broadly speaking, Hansen has followed the sequence of topics found in the original. He agrees that a more logical arrangement might have been offered, but feels that any drastic changes of sequence would have defeated his primary purpose. Nevertheless, and despite the general worth of the content of this book, the reviewer has some doubts as to the value of its pedagogical approach. At its best, it may well stimulate a greater awareness of what is to be found in Keynes, but this is also the sort of book which could do for Keynes what the *School Shakespeare* has done for the Bard. Close annotation of this kind must take away some of the joys of personal discovery that many of us experienced, if not on a first reading, at least at the second or third. There is still some merit from a teaching point of view, especially with the better students in mind, in recommending an unassisted reading of the original, even at the cost of some agony of mind, prior to considering what others say the author meant. Though this be a busy age, it would be a pity if universities lent their name to the crammer's technique. Hansen's book is not of this character, but there are dangers that it may be put to a perverted use (*vide*, pp. 213-4, where the "essentials of Keynes' discussion of the trade cycle" are "summed up"). The one major safeguard against this possibility is the generally "advanced" character of this book. It is not the sort of thing you could put into the hands of first-year students. A very close reading of Hansen and Keynes will still be necessary and the student will thereby be forced to think for himself.

J. S. G. WILSON.

SHORTER NOTICES

Introduction to Mathematical Statistics. Second Edition. By P. G. HOEL. John Wiley & Sons, New York; Chapman & Hall. 1954. xi + 331 pp. 40s.

The first edition of this admirable text-book was published only seven years ago, yet so rapid have been the shifts of emphasis in the teaching of statistical theory since the war that for this new edition the author has felt called upon to undertake extensive revisions. The resulting book can be warmly recommended to anyone requiring an introduction to the theoretical background of modern statistical methods and whose mathematical attainments extend as far as elementary calculus. The style is simple and lucid and difficult ideas have been excluded. The main change in the second edition is in the prominence given to probability and to the theory of significance testing. In addition the sections on regression theory, analysis of variance, experimental design and non-parametric methods have been expanded considerably to bring them into line with modern ideas.

International Cycles and Canada's Balance of Payments, 1921–33. Canadian Studies in Economics, No. 1. By V. W. MALACH. Toronto University Press. London: Geoffrey Cumberlege. 1954. xii + 154 pp. 24s.

" This essay is intended primarily as a study of the interrelations between cyclical fluctuations and the balance of payments." Its main purpose is to see how well various theories (outlined briefly in an introductory chapter) can explain Canadian experience from 1921 to 1933. The case chosen for examination is a particularly interesting one, because of Canada's situation as a country that is both economically " young " and highly dependent on international trade. Professor Malach illuminates the course of events by an extremely careful compilation and examination of statistical series.

Social Change in South-West Wales. By T. BRENNAN, E. W. COONEY and H. POLLINS. C. A. Watts & Co. Ltd. 1954. viii+200 pp. 21s.

The Swansea area is in many ways distinct from the eastern part of Industrial South Wales. Though its industrial roots may be traced back a number of centuries the main economic developments in the area occurred comparatively recently. *Social Change in South-West Wales* begins with a convenient summary of aspects of the economic and social history of the district, and then surveys recent changes.

A useful account is given of changes in the structure of the population and of industry, whilst the later analysis of religious, trade union and political leadership provides new and interesting facts on those subjects. The reader may disagree with the conclusions which the authors draw (sparingly) from their analysis. He will have, at least, a more solid basis for his opinion.

How the City Works. By O. R. HOBSON. News Chronicle Book Department. 1954. 160 pp. 6s.

This book—a completely revised edition of a pre-war work of the same title—surveys the present organisation and working of the institutions which are the core of the City—the banking system, the foreign exchange and bullion markets, the Stock Exchange and the commodity markets. There are also chapters on Treasury Bills, Monetary Control and Exchange Control. The book is very sound and easy to read, giving the reader a sense of having been taken close to the institutions which it describes. These admirable qualities make it a first-class introduction to British financial institutions for first or second year students.

The Budget Cycle in Public Finance in the United States of America. By O. BAKKER. W. P. van Stockum and Zoom, The Hague. Bailey Bros. and Swinfen Ltd. 1953. vii + 163 pp. 17s. 6d.

Following a procedure made familiar by Kurt Heinig, Dr. Bakker has written a chronological account of the " budget cycle " which embodies a study of both financial procedure and government accounting in the United States. Its main value is as a work of reference to those who already know something of the background to federal finance in the United States.

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Seven Centuries of Building Wages

By E. H. PHELPS BROWN and SHEILA V. HOPKINS[1]

The secondary sources exist from which to construct a fairly continuous record of the money wage-rates of building craftsmen and labourers in southern England, typically in Oxford, from the later thirteenth century to the present day. Some apology is due for piecing and patching with secondary sources, when the primary materials are probably there for more detailed and solid work; but the magnitudes and epochs of the main movements are not in doubt, and the results which can be won from what is immediately accessible seem worth setting out for the sake of their grand perspective.

The changes of seven centuries can be surveyed together in Fig. 1, and are set out period by period in Fig. 2. The data are in Table I.

I

We must say something first about the sources[2] and how we have used them.

Until 1700 we have depended on Thorold Rogers. He drew chiefly on the college and estate accounts in the muniment rooms of some of the Oxford and Cambridge colleges, and the farm bailiffs' rolls and monastic accounts in the Public Record Office. Of his builders' wages, some 40 or 50 per cent. come from Oxford itself, down to 1620; the other main region of origin is the southern counties, of which fourteen provide entries, the most represented being Bucks, Hants, Sussex, and Kent. Cambridge contributes substantially throughout, and when the entries from Oxford fall off after 1620 it is Cambridge, and Eton, that take up the running. For the most part, the entries for craftsmen come at the rate of fifteen or more a year; but except for 1580–1620, those for building labourers are much fewer—more like three a year. There is a great falling off in entries of all kinds after 1660.

---

[1] Mr. B. D. Nomvete carried out the first survey down to 1700. We are indebted to Professors T. S. Ashton, E. M. Carus-Wilson and F. J. Fisher for reading our script and giving us much judicious encouragement and restraint in this gallop across their fields.

[2] J. E. Thorold Rogers: *A History of Agriculture and Prices in England*. Elizabeth W. Gilboy: *Wages in Eighteenth Century England* (Harvard Economic Studies, 1934). A. L. Bowley: " The Statistics of Wages in the U.K. during the last Hundred Years (Part VIII). Wages in the Building Trades—concluded " (*Journal of the Royal Statistical Society*, LXIV, March, 1901). *Standard Time Rates of Wages and Hours of Labour in the U.K.*, published by the Labour Department of the Board of Trade, later the Ministry of Labour, in 1894 and later years. Articles on " Changes in Rates of Wages and Hours of Labour " in the *Labour Gazette* of the Board of Trade, later the *Ministry of Labour Gazette*, monthly from May 1893.

When he had assembled his quotations for each occupation in each year, Thorold Rogers sometimes took out the average of them all, but often selected the highest. Both methods have the advantage of drawing, in some measure, on the whole range of evidence available each year, but both may be affected by changes between one year and another in the places from which the quotations came—we know that regional differentials were sometimes wide; they also altered a good deal in the course of time.[1] The apparent movement between one year and another may also be influenced by the cropping up of high rates paid to specially skilled men, or low rates paid when part of the wage was in kind, or reduced rates for the shorter winter day.

For these reasons we avoided any mechanical treatment of the series for the various crafts and their labourers, but graphed them: then, amid the year-to-year movements, we looked for rates which we could regard as representative because they were recurrent. When the labour market was settled, such rates usually did appear clearly, especially for the carpenter: there might be, for instance, a higher and a lower rate, a penny apart, appearing in rough alternation for a number of years together; or, as in the fifteenth century, a powerful concentration upon a single rate. In such periods we assumed that the prevailing rate, or bracket of rates, was unchanged. When the labour market was moving, however, the picture was far less clear; what usually happened then is illustrated by Fig. 3. It is what we should expect in a market of individual contracts: when the demand for labour rose, certain new engagements took place at higher rates; this marginal demand price took time to spread to other engagements, which at first continued at the customary rates, but as the proportion of new engagements rose, or some of the men in old engagements got sympathetic rises, a market formerly concentrated upon one rate now came to show a bracket of two; and then perhaps a third, yet higher rate would appear, and the general rise in the market would be brought about by the gradual cessation of engagements at the original rate while those at this latest rate increased. In such times of transition we could not take any one rate as representative, and the data are not numerous or similar enough to make an average reliable: so the most we could do was to set bounds to the movement. Even these bounds are somewhat indefinite: signs of the stirring of demand may appear before the first date we give for movement, and some dispersion persist after we regard a new rate as established.

[1] Thorold Rogers gives a regional array of rates for threshing in the 14th century, with Norfolk highest and the west lowest (*A History of Agriculture and Prices*, Vol. I, p. 263). But of the 15th century he says, " I detect but little difference in the wages of the husbandman, wherever he was hired, from the extreme east to the farthest west of England, from the north to the south ", except in and around London, and this differential too " almost disappears " in the later part of the 16th century, (*op. cit.*, Vol. IV, p. 490). Of 1583–1702 he says " the wages paid in the Midland and Eastern are fully 50 per cent. higher than the Northern rates, and such a difference appears to be regularly maintained " (*op. cit.*, Vol. V, p. 632). Dr. Gilboy (*op. cit.*, p. 220), has brought out the great relative rise of wages in the North in the eighteenth century.

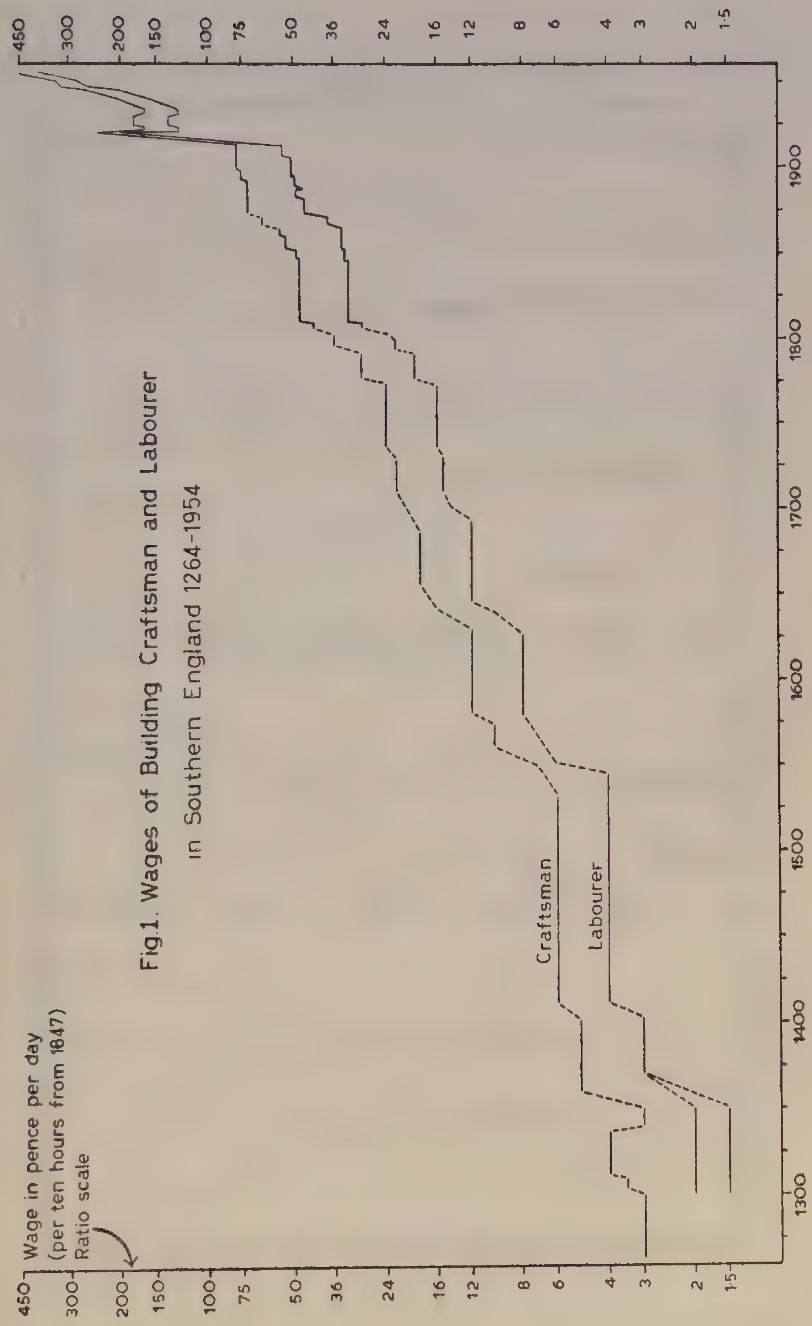


Fig. 1. Wages of Building Craftsman and Labourer in Southern England 1264-1954

Fig. 2: Wages of Building Craftsman & Labourer in Southern England 1264-1954, by overlapping periods

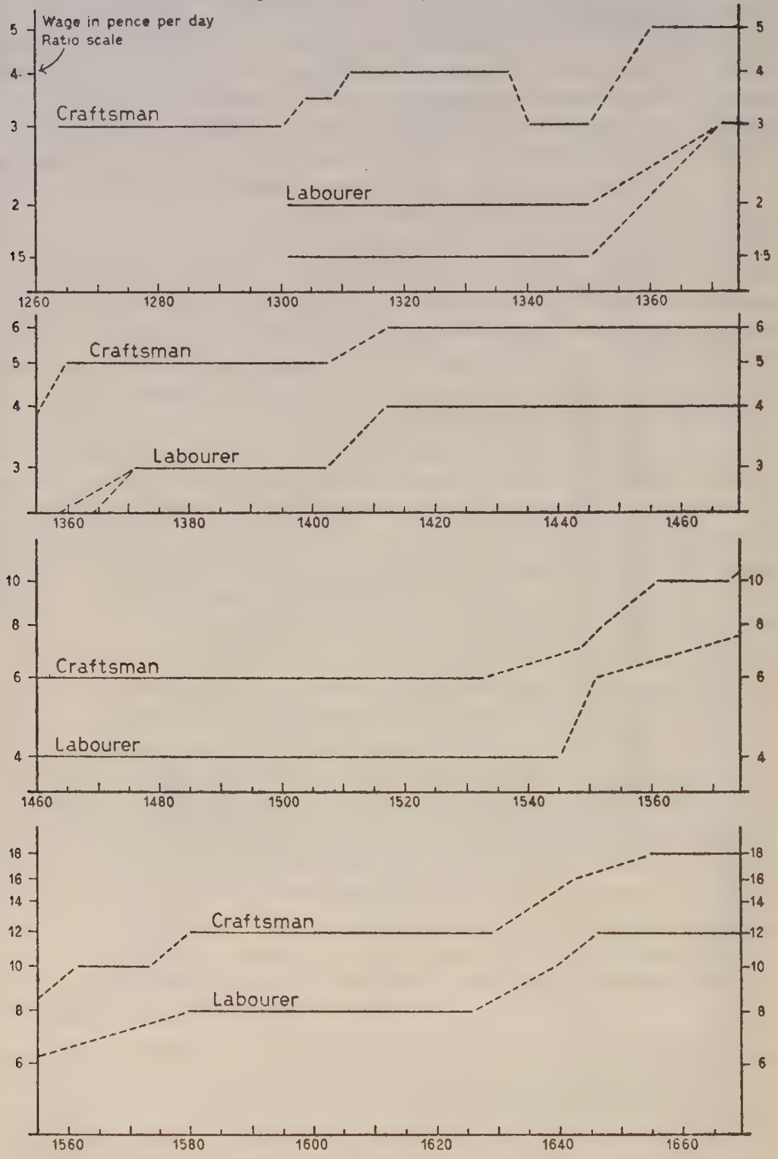
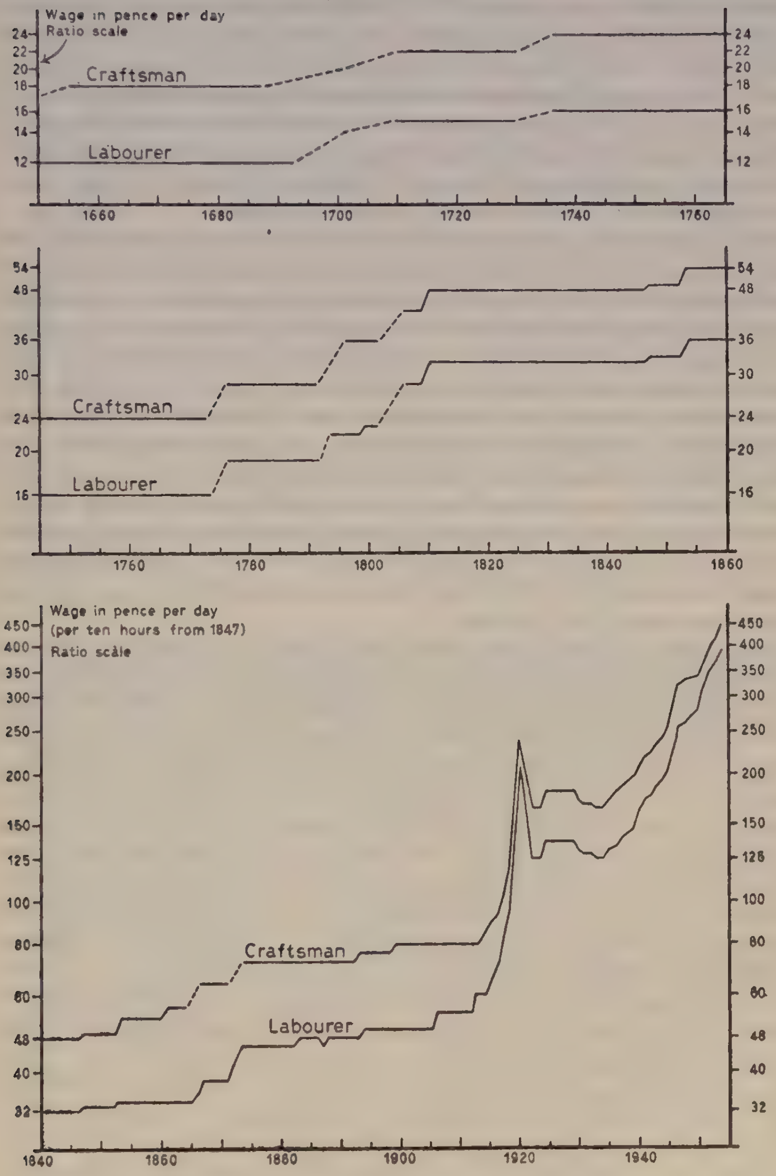


Fig.2. Continued



Several crafts are represented. In our materials from Thorold Rogers, the carpenter and mason are virtually alone at the outset, and they always predominate, but in the fifteenth century they are joined by the tiler, and near the end of the sixteenth century the bricklayer and plumber appear. Before the Black Death, the carpenter's rate seems to have ruled above the mason's; afterwards, all the crafts except the better paid plumber would show the same recurrent rate in a settled market, but the carpenter still showed more upward variants, and led the field in the Tudor rise. Since he provides the most numerous quotations and the most continuous record, it is his rate we have generally followed when there is divergence.

As a check on a record of fairly wide and varying coverage, we compiled one from a single district. The entries from Oxford, city and county,[1] are numerous enough to yield representative rates, on the same principles as before, for craftsman and labourer. The series we now present were arrived at only after the rates first drawn out had been compared with those from Oxford. In settled times the two were always the same, but the dating of transitions differed, and it was here that we reconsidered the evidence and sometimes altered our first findings. One of these differences deserves special mention—elsewhere there were signs of a rise before 1620, and a general movement set in by 1628 which carried the craftsman's rate, from its settled level of 12d., to 16d. by 1642, and 18d. by 1655; but the Oxford entries remain constantly at 12d. until 1640, and then, after a gap, appear already settled at 18d. in 1644.

From 1700 we could look ahead to the 1890's, when the wage reports of the Board of Trade begin. Our guides through the years between are Dr. Elizabeth Gilboy and Sir Arthur Bowley: but Dr. Gilboy's entries from Oxford are not continuous, and fade out in the 1770's, and in the nineteenth century Bowley's best series is for London. Dr. Gilboy, however, has a long run for Maidstone, and we know that the Maidstone rates were the same as the Oxford rates in the first half of the eighteenth century and again in the 1890's: so we took the Maidstone series as representative of Oxford from the 1730's till it ends with the century. Similarly, from that point on we used Bowley's series for London, but of course only as an index, the actual London wages being always higher; from 1700 to 1780 the Oxford rate was usually "London less a third", but in the 1890's it was "London less a fifth", and if we carry back a Bowley series adjusted by this last figure, we get a tolerable though not exact join with Maidstone around 1800. Thus we bridged the gap—the bridge is shaky but not useless—until with the reports of the Labour Department of the Board of Trade we are on comparatively firm ground again from the 1890's onward.

Our rate for the labourer was reached in the same way as the craftsman's rate, except that since Thorold Rogers does not tabulate a labourer's rate before 1402, we had to do the best we could there with the not very numerous original entries. But in 1801–60 we have had to rely solely on Bowley's observation that " labourers' wages were in general almost exactly two-thirds of artisans' wages throughout the century, but in times of change show a tendency to lag behind for a year or two ".[1]

---

[1] The county entries are relatively few, and virtually cease after 1542. Surprisingly, perhaps, they show no systematic difference from the city.

The modern shortening of the working week began in our field about 1847. We have assumed that the day which was the unit until then was one of ten hours (though the winter day was shorter), and to maintain continuity from 1847 onwards we have quoted the pay for ten hours.

At the last, how much reliance can we place on the results? The years for which evidence is thinnest are from about 1660 to 1891, and for most of this time we depend on the assumption that the course of change was the same in Oxford as in Maidstone or London. Outside those years, our line is reasonably continuous for Oxford, but its wider application is limited by the fact that regional differentials were considerable and changed from time to time. In times of transition there was a dispersion of rates in any one place, and we have not been able to do more than set bounds to the movement and sometimes indicate the level reached at some stage within it. But when there was a settled rate, prevailing for some years together, we can hardly have failed to get hold of it.

II

Some features of the broad view these results afford may interest the economist. But since they have been reached in a particular way, from series of a particular kind, in a particular industry, the question how far they are representative must always be borne in mind.

(1) There is, first, the extraordinary absence of falls. On the face of it our record shows only three for the craftsman—in the 1330's, in 1921–23, and in 1930–33; with falls for the labourer in these last two depressions and once earlier, in 1887. Certainly, our method of taking a representative rate is biased towards stability: in an unorganised market, with individual engagements, the average might rise or fall while one and the same rate remained predominant, and in ignoring variants which arose from special conditions of the job we may well have neglected not a few which marked an actual movement of the market.[2] It is likely, moreover, that there were fewer actual falls among our kind of wage-payments than elsewhere, since for most of our period these payments were made not by employers to wage-earners but by customers to craftsmen working on their own account, and these customers were generally institutions and not private

[1] *J.R.S.S.*, March, 1901, p. 104.

[2] cf. Beveridge's evidence for a fall in builders' rates within the first decade of the 14th century: " Wages in the Winchester Manors ", *Economic History Review*, VII, 1, Nov. 1936, p. 30, n.1.

persons who had to put their hands into their own pockets. In later years, again, the recognised or negotiated rates we follow will have been secretly cut, in not a few engagements, when trade was slack. In the eighteenth century Ashton has found that "the inelasticity of rates of pay in the building trades was not representative of wages in industry as a whole".[1] But after due allowance for these things, the absence of *sustained* falls and of falling *trends* remains remarkable. It has been called the elbow-joint or ratchet effect.

(2) Subject to the qualifications just suggested, the record substantiates Adam Smith's remarks that "in many places the money price of labour remains uniformly the same sometimes for half a century together"[2]; and that wages did not vary from year to year with the price of provisions.[3] The great case is the persistence of the craftsman's rate of 6d. a day without apparent variations for a hundred and twenty years, from around Agincourt until the Reformation[4]; but of the whole span until 1914 it can be said that rises in the rate were interspersed with periods of no change, persisting for as much as thirty and sometimes more than forty years together. In all, there seems to have been no change, of the sustained kind we record, in about 500 years out of 690. It is unlikely that supply and demand remained exactly balanced at the ruling price; rather it must have been that their movements were not wide enough to overcome the inertia of convention. That inertia may have been strong enough to resist considerable pressure—especially, as we have suggested, pressure downwards. But the market forces may none the less have changed the effective terms of engagement from time to time, by altering, for instance, the output expected, or what nowadays we call the fringe benefits, without the quoted rate being changed.

(3) The same strength of convention may be seen in the remarkable stability of the differential between the rates of the craftsman and his labourer. Our figures bear out the decline in that differential noted by Beveridge[5] and Postan[6] in the hundred years down to about 1410; but after that there was no sustained change until the First World War. In the fifteenth century the craftsman got half as much again as the labourer, 6d. a day to his 4d.; in the 1890's he got half as much again, 7½d. an hour to his 5d.; he got half as much again, or within a halfpenny of it, in every settled period in between. Here as before, we cannot believe that market forces always worked to keep the equilibrium prices of the two grades of labour in so constant a relation: the most that

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[1] T. S. Ashton: *An Economic History of England: the 18th Century*, pp. 224–226.

[2] *Wealth of Nations*, Bk. 1, c. VIII.

[3] *Op. cit.*, Bk. I, c. V.

[4] But of eight Winchester manors in our region, five show definitely higher rates for carpenters after 1439 than before: Beveridge, *op. cit.*

[5] *Op. cit.*

[6] M. M. Postan, "Some Economic Evidence of Declining Population in the Later Middle Ages", *Economic History Review*, N.S. II, 3, 1950. See also Johan Schreiner, "Wages and Prices in England in the Later Middle Ages", *Scandinavian Economic History Review*, II, 2, 1954.

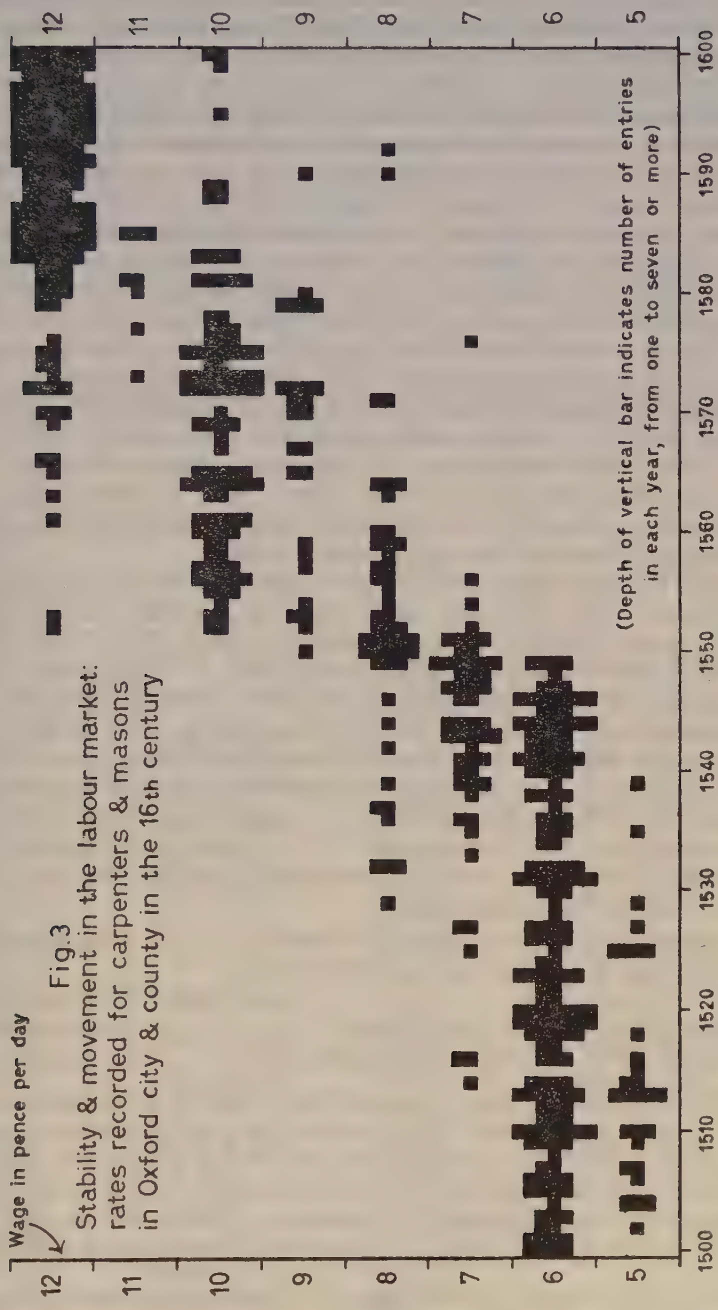

Fig.3

Stability & movement in the labour market: rates recorded for carpenters & masons in Oxford city & county in the 16th century seems probable is that they did not make for any wide divergence, until in the twentieth century the effects of more widespread education, together with inflation, became apparent in a general reduction of the differential for skill—by 1954 the craftsman's rate was less than 15 per cent. above the labourer's. In times of rising rates the differential was disturbed; there are indications that the labourer's rate sometimes began to rise later than the craftsman's, and then rose faster so as to narrow the gap for a while; but the dispersal of quoted rates at these times is generally too great for any definite relation to be established. So far as the five hundred years' recurrence of the one simple differential was due to convention, we may wonder whether it worked to hold the craftsman's rate back to that which ruled for general labour, or to give those general labourers who entered the building trade the benefit of a fixed proportion of the rate the craftsman could command. The convention that related the labourer's rate to the craftsman's as two to three made for a narrower differential than is recorded in 1880–1900 for some other employments: in engineering then the labourer was getting about three-fifths of the fitter's rate, in shipbuilding the labourer got about half the shipwright's rate, on the railways the goods porter got about half the engine driver's rate.[1]

(4) The most salient feature of all is the extent of the rise: for the craftsman, from 3d. a day under Henry III, to 445d. for 10 hours' work under Elizabeth II—multiplication by nearly 150. There is one sense in which the rise does not appear so great; if it had gone on at the same rate all the way through, an annual rise of less than three-quarters of one per cent. would have sufficed to cumulate it. But we have seen that out of 690 years, only about 190 seem to have been years in which the craftsman's rate underwent a sustained change, and within these alone the total rise is equivalent to an annual rise of nearly two and two-thirds per cent., compounded. It is instructive to compare four epochs: the average annually compounded rates of rise, taking all years together in each epoch, are:—

Reformation to Restoration (1532–1660): ..	0·86 per cent.
Industrial Revolution to First World War (1760–1913):	0·79 per cent.
The Tudor Inflation (1532–1580):	1·46 per cent.
Epoch of the Two Great Wars (1914–54): ..	4·24 per cent.

It is for a detailed study of each period to show how far the observed rises can be attributed to one or more of the possible causes—changes of demand and supply in the market for building labour; the initiative of combinations in that market; and changes in the flow of aggregate monetary demand throughout the economy. But it can be said here that the vast change which has come about from end to end is the product of rises which themselves did not need to be very great from one year to another, in a system whose ratchet prevented the rises of some years being offset by falls in others, and so caused the rises to cumulate.

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[1] K. G. J. C. Knowles and D. J. Robertson, " Differences between the Wages of Skilled and Unskilled Workers, 1880–1950 ". *Bulletin of the Oxford University Institute of Statistics*, 13, 4, April, 1951.

In a later article we hope to compare these movements of money wage-rates with contemporary changes in the prices of some basic consumables.

The London School of Economics.

TABLE 1

MONEY WAGE-RATES OF BUILDING CRAFTSMAN AND LABOURER, IN SOUTHERN ENGLAND 1264–1954. PENCE PER DAY THROUGH 1846; FROM 1847, PENCE PER 10 HOURS. CALENDAR YEARS.

	Craftsman		Labourer
	d.		*d.*
1264–1300	3		
1300–04	From 3 to 3½		
1304–08	3½		
1308–11	From 3½ to 4	1301–50	1½ or 2
1311–37	4		
1337–40	From 4 to 3		
1340–50	3		
1350–60	From 3 to 5	1350–71	From 1½ or 2 to 3
1360–1402	5	1371–1402	3
1402–12	From 5 to 6	1402–12	From 3 to 4
1412–1532	6	1412–1545	4
1532–48	From 6 to 7		
1548–52	From 7 to 8	1545–51	From 4 to 6
1552–61	From 8 to 10		
1561–73	10	1551–80	From 6 to 8
1573–80	From 10 to 12		
1580–1629	12	1580–1626	8
1629–42	From 12 to 16	1626–39	From 8 to 10
1642–55	From 16 to 18	1639–46	From 10 to 12
1655–87	18	1646–93	12
1687–1701	From 18 to 20	1693–1701	From 12 to 14
1701–10	From 20 to 22	1701–10	From 14 to 15
1710–30	22	1710–30	15
1730–36	From 22 to 24	1730–36	From 15 to 16
1736–73	24	1736–73	16
1773–76	From 24 to 29	1773–76	From 16 to 19
1776–91	29	1776–91	19
1791–96	From 29 to 36	1791–93	From 19 to 22
1796–1802	36	1793–98	22
		1799–1802	23
1802–06	From 36 to 43	1802–06	From 23 to 29
1806–09	43	1806–09	29
1810–46	48	1810–46	32
1847–52	49	1847–52	33
1853–60	54	1853–65	34
1861–64	56		
1864–66	From 56 to 64	1866	36
1866–71	64	1867–71	38
1871–73	From 64 to 72	1872	42
1873–92	72	1873–82	46

Craftsman		Labourer	
	d.		d.
		1883–86	48
		1887	46
		1888–93	48
1893–98	75	1894–1905	50
1899–1913	80	1906–12	55
1914	85	1913–14	60
1915	90	1915	65
1916	93	1916	73
1917	103	1917	83
1918	120	1918	95
1919	170	1919	140
1920	240	1920	210
1921	205	1921	165
1922–23	165	1922–23	125
1924–29	180	1924–29	138
1930	175	1930	133
1931–32	170	1931–32	128
1933–34	165	1933–34	125
1935	175	1935	133
1936	180	1936	135
1937	185	1937	140
1938	190	1938	143
1939	195	1939	148
1940	210	1940	163
1941	220	1941	173
1942	225	1942	178
1943	235	1943	185
1944	245	1944	193
1945	255	1945	205
1946	295	1946	238
1947	325	1947	260
1948	330	1948	265
1949	335	1949	275
1950	340	1950	285
1951	370	1951	315
1952	400	1952	345
1953	420	1953	365
1954	445	1954	390

A System of National and Domestic Accounts

By G. Stuvel

In national accounting a distinction is made between national and domestic concepts. The former refer to the economic activity of members of the nation, i.e., the normal residents of the country. The latter refer to the economic activity taking place on the domestic territory, i.e., the territory lying within the frontiers of the country. The differences between the two types of concept thus appear to arise from the fact that normal residents may engage in economic activity abroad and that part of the economic activity taking place in the domestic territory may be activity of foreigners.

Of the domestic concepts one at least, namely that of domestic capital formation, has acquired a firmly established position in all national accounts systems. As the argument proceeds it will become clear why, although by origin not a national concept, its position among the proper national concepts is not challenged by some sort of concept of national capital formation, representing the total of capital formation normal residents engage in not only at home but also abroad.

With regard to product or income, the situation is quite different. Here the domestic and the national concept have always been rivals. The difference between the two concepts is that the national concept includes and the domestic concept excludes factor income earned abroad by normal residents while, on the other hand, factor income earned by foreigners in domestic enterprise, and therefore payable to abroad, is excluded from the national and included in the domestic concept.

Most systems of national accounts employ the national rather than the domestic concept of product or income. This is quite understandable, for our present-day national accounts are to be considered as a further development of the national income work initiated during the interwar period. This alone would be enough to account for a bias towards the use of national concepts in national accounting. In addition to this there is the suggestion contained in the term " national accounts " that these are the accounts of the nation and not of the country. However, careful consideration shows that the case for developing purely domestic accounts, using exclusively domestic concepts, is about as equally strong or weak as the case for developing purely national accounts, and that neither presents what might be said to be an ideal solution, if there is any such thing as an ideal solution.

That the domestic product concept has been able to hold its own and has survived up till the present is mainly due to the obvious advantages it has in presenting a breakdown of product by industry. It proves hard and rather meaningless to allocate in such a breakdown by industry the net factor income from abroad, which has to be added to the domestic product in order to obtain the national product. Another argument often put forward in favour of the domestic product concept is that there is no means of deflating factor income for price changes over time apart from treating it as the value of net output, i.e., as an aggregate of the volumes of all the goods and services produced in the domestic economy with the help of the domestically employed factors of production minus the goods and services (imported and home-produced materials) that have been used in producing them. This procedure results in a deflated value of net output *as a whole* for separate industries or even individual firms. This is generally considered adequate proof for the conclusion that there is no means of further decomposing this deflated value of net output with reference to the individual factors of production that have contributed to it, implying that factor income to and from abroad cannot be deflated. The question as to whether this conclusion is justified or not can be left aside here.

Given the fact that there are two concepts of product or income, a national and a domestic one, the question may be asked whether the same holds true for consumption. The answer is in the affirmative. National consumption represents the consumption of normal residents at home and abroad, and domestic consumption represents all consumption on domestic territory by normal residents as well as foreigners. The difference between the two concepts thus appears to consist of the difference between the consumption abroad of normal residents and the consumption of foreigners on the country's domestic territory.

Given the equality between product plus imports on the one side and consumption plus domestic capital formation plus exports on the other, it is evident that different definitions should be applied to imports and exports according to whether the national or the domestic concepts are used for product and consumption. In case the domestic concepts are used, imports and exports ought to be defined as covering the goods and services which cross the country's borders. In case the national concepts are used for product and consumption the differences with the corresponding domestic concepts ought to be balanced by equal differences in imports and exports. This can be achieved by defining national imports and exports as follows:

national imports = domestic imports + factor income to abroad + consumption abroad of normal residents.
national exports = domestic exports + factor income from abroad + consumption of foreigners on domestic territory.

In this context, it proves helpful to consider factor income to and from abroad as payables and receivables on account of delivery of factor services.

The equality: product + imports = consumption + capital formation + exports can also be written in the form of an account. This account, which we shall call the domestic product account, can be looked upon as a consolidation of the product (or operating) accounts of all the production units situated on the domestic territory.

A similar account employing wherever appropriate (i.e., except for domestic capital formation) the national instead of the domestic concepts (and which therefore might suitably be called the national product account) can only be interpreted in the same manner (1) by attributing to the normal residents, who either supply factor services to the outside world or consume goods and services abroad, the function of national production units engaged in exporting domestically acquired factor services or in importing goods and services for their own consumption, and (2) by doing the same in respect of foreigners supplying factor services to domestic production units or consuming domestically produced goods and services. All this is, of course, highly artificial and it would therefore appear advisable to consider carefully the possibility of setting up a system of accounts of which the domestic product account forms an integral part.

This aim of incorporating the domestic product account in the system of accounts cannot be achieved in a satisfactory manner by changing over from a system of purely national to a system of purely domestic accounts as one perhaps might be inclined to think. The interpretation of a domestic income (or appropriation) account causes difficulties similar to those encountered in the interpretation of a national product account. The national income account can be looked upon as a consolidation of the individual income accounts of all the normal residents of the country. This can no longer be done in a meaningful manner if we substitute domestic concepts for national concepts in these accounts. The domestic spending on consumer goods and services need not be spending out of domestically earned income of normal residents or foreigners. It may also, at least in part, be spending out of income earned abroad by either residents or non-residents.

It thus appears that in order to achieve our aim we have to construct a system of accounts which contains a domestic product account along with a national income account. This is not so strange as it may sound. It merely brings home to us the indisputable fact that every economy consists of (1) domestic production units which can exercise their production activity only on the domestic territory on which they are located, and (2) normal residents of the economy, who can exercise their activities such as the earning of an income (by supplying factor services to production units) and consuming part of this income, not only at home (on the domestic territory) but also abroad.

Once this is realised and accepted, all the rest follows. Apart from the transactions which are recorded on the current accounts discussed above, both sectors also engage in transactions which should be recorded on capital account. The link between the two types of account is established by internal bookings, as I have explained elsewhere[1]. In the case of the normal residents these internal bookings concern their saving over the accounting period, i.e., the unspent part of their income. In the case of the domestic production units the internal bookings are in respect of capital formation, i.e., the addition to their stock of goods over the accounting period. That it is the domestic production units, and not the normal residents, which engage in capital formation explains why there is no room for a concept of national capital formation as distinct from domestic capital formation. It would be equally difficult to conceive of domestic saving as distinct from national saving.

A complication arises from the fact that corporations do not as a rule disburse all the factor income earned, but often retain part of it, putting what remains after payment of taxes and other transfers to reserves. This makes it necessary to open income accounts for corporations and to consider the corporations themselves for this part of their activity as residents of the country in which they are located. Their income accounts will differ from those of the normal residents in that they do not contain entries for consumption either at home or abroad, but they may, apart from entries for domestically earned income, also contain entries for income earned abroad, namely if part of the financial capital of the corporation is invested abroad. Similar complications arise in the case of unincorporated businesses. Here it normally proves impossible to separate from each other the income accruing to the firm itself and to the owner of the firm, and so it may be necessary to keep a joint income account for the owner and the firm. However, it should be noted that the product accounts of the production units concerned are in no way affected by these complications and that is all that really matters from the point of view of setting up a system of accounts for the economy as a whole which contains a domestic product account alongside a national income account.

Very much the same as has been said in respect of the income accounts applies to capital accounts. These accounts have to be kept for normal residents as well as domestic production units, the only significant difference being that capital formation is an item which can only appear on the capital accounts of the domestic production units. To indicate clearly that the consolidated capital account for the economy as a whole contains national as well as domestic concepts, we shall call this account the national and domestic capital (or resting) account.

Apart from the internal bookings, entries on capital account are also made in respect of certain transactions, which might be called investment transactions. They show how the savings of the period are invested and how the capital formation of the period is financed. In principle it is even possible to distinguish two accounts here, the first showing how the financial capital that is created during the period through saving has been invested (in shares, bonds, credits, etc.), and the second showing how the real capital formation of the period has been financed (through the issue of shares and bonds, acquisition of credits, etc.). The first of these accounts might suitably be called the national financial capital formation (or saving) account and the second the domestic real capital formation account.

From an accounting point of view, the most characteristic feature of the investment transactions is that they are recorded on capital accounts only and that they are also the only transactions (as distinct from internal bookings) which are recorded on the capital accounts. Consequently, in so far as these transactions are concluded between residents of the country (including the domestic production units) they will be recorded at equal amounts on the debit and credit sides of individual capital accounts and thus disappear in the process of consolidation of these individual accounts into a national and domestic capital account. In other words, for a closed economy national saving and domestic capital formation will prove to be equal in value. This is not necessarily so for an open economy, as part of the national saving may have been invested abroad. This part is commonly referred to as foreign investment.

Investment transactions are not the only transactions which give rise to debit and credit entries on one and the same type of account. The same applies to transfers which are recorded on the debit side of the income account of the transactor making the transfer and on the credit side of the income account of the transactor receiving the transfer. Intra-national transfers cancel out in the national income account for the same reason as the intra-national investment is reduced to zero in the national and domestic capital account. There is, however, no reason why international transfers should be zero on balance. These foreign transfers cause the national factor income to differ from the national disposable income.

Much the same is true of product accounts. Here it is the internal deliveries of goods and services between domestic production units belonging to the same economy that cancel out, while the deliveries of domestic production units to foreign production units are recorded in the item domestic exports, and deliveries between these production units flowing in the opposite direction in the item domestic imports.

The system of accounts that emerges from the foregoing discussion may be presented in the following form, in which for the sake of brevity and clarity I have chosen a particular country, namely the United Kingdom, as the economy for which the accounts are constructed. The accounts refer to the year 1953 and apart from a rough estimate of domestic capital consumption, namely £1,460 million (i.e., 10 per cent. of gross domestic product at factor cost), all data have been derived from the information contained in Tables 1, 7 and 19(i) of the Blue Book, 1954 [2].

UNITED KINGDOM

Domestic Product Account

£ million

Item		1953	Item		1953
	Factor services of:			Consumption goods and services delivered to:	
1·1	U.K. residents (2·4)	14,819	1·4	U.K residents (2·1)	14,018
1·2	non-U.K. residents (4·7)	346	1·5	non-U.K. residents (4·3)	116
	Net Domestic Product	15,165		Domestic Consumption	14,134
1·3	Domestic Imports (4·5)	3,248	1·6	Net Domestic Capital Formation (3·1)	1,074
				Net Domestic Expenditure	15,208
			1·7	Domestic Exports (4·1)	3,205
	Net Domestic Input	18,413		Net Domestic Output	18,413

National Income Account

£ million

Item		1953	Item		1953
	Consumption			Factor income earned	
2·1	in U.K. (1·4)	14,018	2·4	in U.K. (1·1)	14,819
2·2	outside U.K. (4·6)	132	2·5	outside U.K. (4·2)	532
	National Consumption	14,150		National Factor Income	15,351
2·3	Net National Saving (3·3)	1,299	2·6	Net Foreign Transfers (4·4)	98
	Disposal of National Income	15,449		Disposable National Income	15,449

National and Domestic Capital Account

£ million

Item		1953	Item		1953
3·1	Net Domestic Capital Formation (1·6)	1,074	3·3	Net National Saving (2·3)	1,299
3·2	Net Foreign Investment (4·8)	225			
	Investment of Net National Saving	1,299		Net National Saving	1,299

Rest of the World

Consolidated Account with U.K. £ million

Item		1953	Item		1953
4·1	Domestic Imports from U.K. (1·7)	3,205	4·5	Domestic Exports to U.K. (1·3)	3,248
4·2	Factor services of U.K. residents (2·5)	532	4·6	Consumption goods and services delivered to U.K. residents (2·2)	132
4·3	Consumption in U.K. (1·5)	116	4·7	Factor income earned in U.K. (1·2)	346
	National Exports of U.K.	3,853		National Imports of U.K.	3,726
4·4	Net Transfers to U.K. residents (2·6)	98	4·8	Net Investment received from U.K. residents (3·2)	225
	Net Payables to U.K.	3,951		Net Receivables from U.K.	3,951

The above system of accounts is fully articulated, i.e., it shows every item twice, once on the debit side as a payable and once on the credit side as a receivable. This has been, and could only be, achieved by making separate entries for the main component elements of those aggregates for which there exists a national as well as a domestic concept. These national and domestic aggregates themselves are shown as subtotals.

The fact that every item in the system is matched by an identical counter-item makes it possible to present the accounts in a different form, namely that of a matrix. This alternative presentation has the advantage that it brings out clearly how the system is constructed.

For a closed economy, for which a distinction between national and domestic aggregates is irrelevant, the matrix presentation of the accounts is as follows (see [1]):

Debit entry on: / Credit entry on:	1. Product account	2. Income account	3. Capital account
1. Product account	Inter-industry deliveries	Consumption	Gross capital formation
2. Income account	Factor income	Transfers	Dissaving
3. Capital account	Capital consumption	Saving	Investments

with the columns showing the entries on the debit sides and the lines the entries on the credit sides of the accounts. It will be noticed that, although the accounts are of the same type as those in the system of accounts set out above, there are certain differences in the basis on which transactions and internal bookings are recorded in this matrix (e.g., gross instead of net capital formation, saving and dissaving instead of net saving, etc.). The reasons for these differences will be explained later on.

For an open economy, such as that of the United Kingdom, a similar, though somewhat more complicated, matrix can be constructed. In order to do this we conceive of the world as a whole, which is a closed economy, as divided into two principal sectors, namely (1) the United Kingdom and (2) the Rest of the World, each of them open economies. Using the following symbols for the different transactions:

L=inter-industry deliveries. C=consumption. P=gross capital formation.
Y=factor income. T=transfers. E=dissaving.
D=capital consumption. S=saving. I=investment.

and adding a first subscript to indicate the economy in the accounts of which the transaction (or internal booking) is recorded on the debit side and a second subscript for the economy in the accounts of which a credit entry is made, the matrix concerned can be written as follows:

	1. United Kingdom			2. Rest of the World		
1. United Kingdom	L_{11}	C_{11}	P_{11}	L_{21}	C_{21}	(P_{21})
	Y_{11}	T_{11}	E_{11}	Y_{21}	T_{21}	(E_{21})
	D_{11}	S_{11}	I_{11}	(D_{21})	(S_{21})	I_{21}
2. Rest of the World	L_{12}	C_{12}	(P_{12})	L_{22}	C_{22}	P_{22}
	Y_{12}	T_{12}	(E_{12})	Y_{22}	T_{22}	E_{22}
	(D_{12})	(S_{12})	I_{12}	D_{22}	S_{22}	I_{22}

In this matrix some squares cannot and some others need not contain any figures. In the first place it should be remembered that except for the investment items all entries on capital accounts are in respect of internal bookings, that is to say bookings on the accounts of one and the same sector. Consequently all the squares in which the symbols have been put in brackets will remain empty. Secondly, there are the squares on the main diagonal of the matrix (from top-left to bottom-right). The symbols in these squares all refer to intra-sector transactions which give rise to identical debit and credit entries on the same account in each case. They may, therefore, as well be deleted, the more so as the amounts concerned depend entirely on the choice made in respect of the breakdown of the main sector into subsectors, the account for the economy as a whole being obtained by combining the individual accounts for each of these subsectors. Finally, lack of knowledge concerning the intra-sector transactions and internal bookings in the Rest of the World sector leaves no choice but to consolidate the three accounts for the rest of the world into one, which disposes likewise of all the entries with subscripts 22 in the bottom right-hand corner of the matrix.

After all this has been done the entries in the system of accounts presented earlier only differ from those in the matrix in one respect, namely that the internal bookings and the international transfers and investments are each recorded on a net basis, that is to say:

(*a*) net domestic capital formation$=P_{11}-D_{11}$
(*b*) net national saving$=S_{11}-E_{11}$
(*c*) net foreign transfers (to U.K. residents)$=T_{21}-T_{12}$
(*d*) net foreign investment (by U.K. residents)$=I_{12}-I_{21}$.

It should be noted that the squares in the matrix in which the entries are made in respect of these items, which are netted out against each other, are in each case on opposite sides of and an equal distance removed from the main diagonal of the matrix.

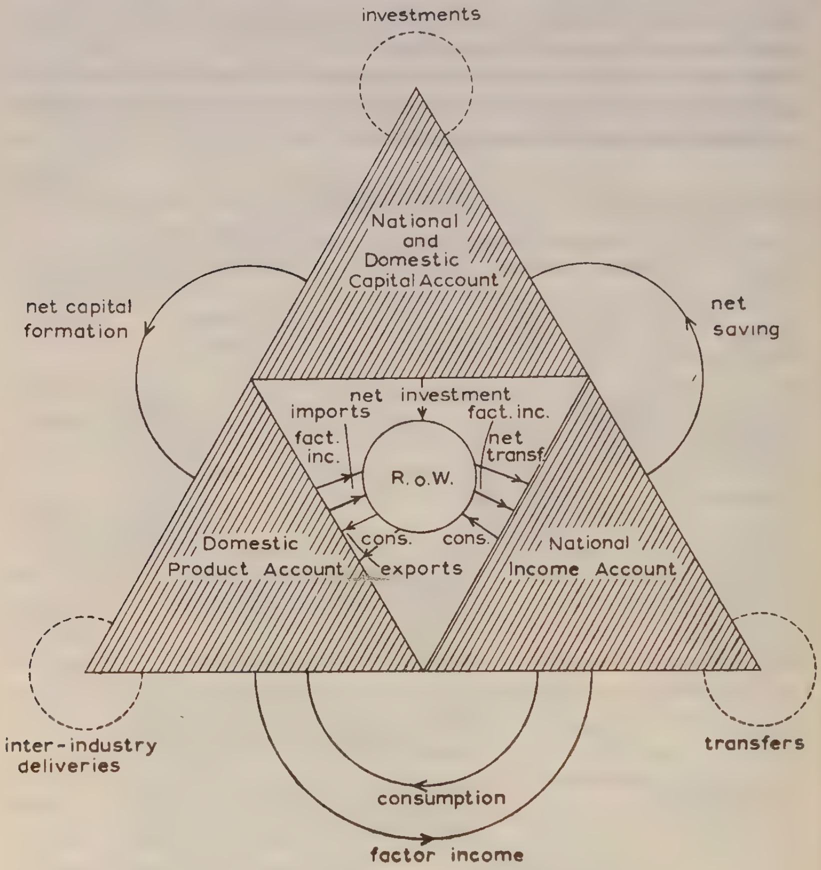
By also recording these transactions and internal bookings on a net basis in the matrix presentation of the accounts, the following matrix is obtained for the U.K. economy in 1953.

THE UNITED KINGDOM ECONOMY IN 1953 £ million

Debit entry on Credit entry on		United Kingdom			Rest of the World			Total
		Domestic Product Account	National Income Account	National and Domestic Capital Account	Consolidated Account			
United Kingdom	Domestic Product Account	▤	14,018	1,074	3,205	116	▤	18,413
	National Income Account	14,819	▤	.	532	98	▤	15,449
	National and Domestic Capital Account	.	1,299	▤	▤	▤	.	1,299
Rest of the World	Consolidated Account	3,248	132	▤	▤	▤	▤	3,951
		346	.	▤	▤	▤	▤	
		▤	▤	225	▤	▤	▤	
Total		18,413	15,449	1,299	3,951			39,112

Apart from purely statistical considerations, the items mentioned have been recorded on a net basis in the earlier presented system of accounts in order to make the two sides of each account, and more in particular the income account and the capital account, add up to meaningful totals. Similarly the logical order in which the items appear in the matrix has not been adhered to in the accounts presentation in order to make it possible to show the various national and domestic concepts as subtotals.

For those who prefer to have a visual aid to follow through the structure of these accounts, still another form of presentation, namely that of a diagram, may prove to be of some help.



Finally it should be pointed out that the above system of accounts can be amended in such a way that there is no need to introduce an arbitrary estimate for capital consumption. All that is required to make this possible (see [1] Appendix I, paragraph 5), is that factor income or product, capital formation and saving are recorded gross of capital consumption.

POSTSCRIPT :

1. Since the above was written Mr. P. Redfern, in a paper on " Net investment in fixed assets in the United Kingdom, 1938-1953 " read before the Royal Statistical Society on 19th January, 1955, estimated capital consumption in the United Kingdom for 1953 at £1,407 million. His figure thus appears to be in close conformity with my admittedly very rough guess of £1,460 million. This would seem to imply that the net figures for factor income, capital formation and saving in the present paper have more than an illustrative value in that they approximately reflect the proper order of magnitude of these national accounts items. In order to be exactly in line with Mr. Redfern's estimate all of them should be raised by £53 million.

2. In order to avoid misunderstanding, I would like to point out that, following the conventions for the definition of national accounts concepts recommended by the United Nations and the Organisation for European Economic Co-operation, changes in stocks of non-fixed assets held abroad by domestic enterprises form part of domestic capital formation. Purchases and sales of goods affecting these stocks held abroad should according to the same recommendations be recorded under imports and exports. This point has not been specifically mentioned in the text, as it would have complicated the argument without materially altering it. This the interested reader will not find difficult to verify.

Paris.

REFERENCES

[1] G. Stuvel, " The Use of National Accounts in Economic Analysis ", International Association for Research on Income and Wealth : *Income and Wealth*, Series IV (London, 1955).

[2] Central Statistical Office, *National Income and Expenditure, 1946–1953* (London, August, 1954).

The I.C.F.C. Revisited[1]

By Brian Tew

Some months ago my former employer, Lord Piercy, chairman of the Industrial and Commercial Finance Corporation, kindly agreed to let me revisit the Corporation and (subject of course to the overriding need to safeguard confidential information) to see how things had developed since my departure in the middle of 1946.

Way back in 1946, less than a year after the Corporation had opened its doors, many important issues still remained to be settled, either by policy decisions or by the hard facts of experience, and the main purpose of my inquiry[2] was to consider these issues as they now appear eight years later. But before presenting my conclusions, may I briefly take stock of what was more or less settled and certain even in 1946?

The Corporation was in existence as a private company, with a nominal capital of £15 millions, subscribed by the Bank of England and the joint stock banks, and with powers to borrow from its shareholders (with their permission) up to £30 millions. The board of directors had been constituted, with Lord Piercy (nominated by the Bank) as chairman, and seven other directors appointed by the joint stock banks. (It was understood that only the Chairman should be a full-time, "working" director, the other directors concerning themselves only with general policy and with specific propositions submitted for their approval. The Corporation had already found its present unpretentious home at 7 Drapers' Gardens, and there Lord Piercy and his original team were already engaged in doing business.

Lord Piercy's team was, by City standards, somewhat novel in its composition. The men at the top had not risen through the ranks—this would anyway have been impossible with such a young institution. Nor were they drawn predominantly from any particular family or social or professional background. They were a thoroughly mixed bag, and in particular they brought together a remarkably wide range of professional experience—a banker or two, four experts on issue business, including a former head of an Issuing House, two stockbrokers, three chartered accountants, a lawyer, an economist, a production engineer, and a building expert.[3] No other City institution has ever thought it needed to bring such a wide range of expertise to bear on the propositions submitted by the clients. That Lord Piercy was prepared to cast his net so wide was due partly to his own open-mindedness, his willingness to experiment, partly to the intention that his Corporation should undertake business of a novel kind, that it should (as we used to say at the time) " fill a gap ".

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[1] An earlier version of this paper was presented to the Liverpool Economic and Statistical Society on October 15th, 1954.

[2] This inquiry, undertaken under the auspices of the National Institute of Economic and Social Research, was made possible by the generous support of the Houblon-Norman trustees.

[3] See the article on Lord Piercy in *Scope*, February 1946.

But what gap? It was no use to answer, " The Macmillan Gap ", first because the Macmillan Committee was far from precise in its description of the " gap " which bears its name, second because the Committee might have erred in its diagnosis, and third because circumstances had clearly altered, both on the side of demand and on that of supply: the financial needs of British industry had presumably changed since 1931, and the range of financial facilities offered by City institutions had undoubtedly widened.[1] What were the financial needs of British industry in the post-war period? How adequately were they going to be met by ploughing back profits, by money from private sources, by the banks, the insurance companies, investment trusts, and the finance houses already in the field? Answers to these questions in 1946 were inevitably tentative and provisional. The gap to be filled could not then be defined with confidence. Moreover, should the new institution simply fill the gap and nothing more? Could it survive solely on business that nobody else would touch? And on the other hand, could it be assumed that institutional finance was suited to filling the whole of the gap: might there not be a fringe of propositions which had to be financed privately or not at all?

THE I.C.F.C. AND OTHER CITY INSTITUTIONS

In describing what I learned from my investigations, I will first consider the least novel aspects of the I.C.F.C.'s business, those analogous to, or that even overlap, the work of other financial institutions.

The I.C.F.C. works under a number of self-imposed restrictions which severely (and even unduly) limit the extent of possible overlapping:

(i) The I.C.F.C. does not provide finance repayable at short notice.

(ii) It provides finance to *businesses* to enable them to add to their assets or to repay excessive short-term indebtedness: it does not operate by buying the rights of existing shareholders.

(iii) It does not provide more than £200,000 at a time.

(iv) With rare exceptions, it buys securities to hold,[2] not to issue to the public.

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[1] See Raymond Frost's article on " The Macmillan Gap, 1931–52 " in *Oxford Economic Papers*, June 1954.

[2] The I.C.F.C. retains the right in certain cases to place securities with a restricted list of institutional investors, including investment trusts, insurance companies and pension funds.

(v) It is not particularly interested in propositions which amount to first-class property mortgages *and nothing more*. (By first-class property mortgages I mean loans secured with a first charge on property which could be sold in almost any circumstances for a sum in excess of the amount of the loan. This condition is unlikely to be satisfied unless the property consists of well built general purpose premises of modern design, situated in a thriving industrial district.)

I have stated these five restrictions roughly in order of diminishing strictness. The first one (against short-term lending) is inviolable, desirable and (since the I.C.F.C.'s shareholders are all bankers) inevitable. The second (limiting the Corporation to providing money for the expansion of businesses, not for buying out existing shareholders' rights) has been almost as rigidly adhered to, at any rate, since the formation of Edith[1], an associated company whose function is intended to be complementary to the I.C.F.C.'s, in that it is to operate almost solely by purchasing existing shareholders' rights.

The third (against more than £200,000 at a time) has always been observed in the letter, but has occasionally been slightly evaded in the spirit, in that the I.C.F.C. has on occasions collaborated with other City institutions to provide a total sum somewhat in excess of £200,000. However, far from criticising the I.C.F.C. for overstepping the limit, I would criticise the limit. The original purpose of the £200,000 limit seems to have been to delineate the frontier between the I.C.F.C.'s province and that of its twin sister, the Finance Corporation of Industry; the latter, however, has kept so far from the frontier that there is a strong case for the I.C.F.C. invading a slice of the unoccupied territory. And since the equivalent in purchasing power of £200,000 in 1945 is clearly in the region of £300,000 today, the raising of the limit to this sum would do no more than give effect to the original intention.

The fourth restriction (against issuing business) has been disregarded only rarely, in rather exceptional circumstances, and even then the I.C.F.C. has usually not taken on the job alone but has sought the collaboration of one or other of the established issuing houses. Has the I.C.F.C. been right to keep out of the issuing business? I wonder. Investigations[2] have shown that the cost of small issues is surprisingly high, the company whose shares are issued not infrequently getting as little as 80 per cent. (or even less) of the amount subscribed by the public. There seems to be a presumption that the technique of making small issues may be capable of improvement, or that the business is insufficiently competitive, and in either case it would be a good thing from the national point of view to let the I.C.F.C. try its hand.

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[1] Edith (Estate Duties Investment Trust Ltd.) began to operate in 1953 with Lord Piercy as its chairman and the I.C.F.C., as its managing agent. A paper dealing with Edith's work is in course of preparation.

[2] See R. F. Henderson : *The New Issue Market*, 1951.

The fifth restriction (against propositions comprising first-class property mortgages and nothing else) might be thought *prima facie* incompatible with the information, given in the I.C.F.C.'s ninth Annual Report, that 38 per cent. of the Corporation's invested funds are in secured loans. In fact, however, there is no incompatibility.

For, in the first place, the I.C.F.C.'s security is often less than what I have called " first-class ". It may comprise a second charge, rather than a first charge, on the customer's premises, or the premises themselves may be designed specifically for some particular technical process, or be sited in an out-of-the-way place, or be badly lighted or multi-storey or in some other way unattractive by modern standards, except in a rather limited range of uses. Or again the I.C.F.C.'s charge may be wholly or partly on the customer's plant or stock-in-trade and work in progress, which might fetch very little under circumstances of a forced sale.

Secondly, some of I.C.F.C.'s secured loans are not " straight " loans, but incorporate options to convert into ordinary shares. Finally (and more important), the I.C.F.C. has often combined secured loans with some other form of participation; for example, the Corporation may have subscribed, as a single transaction, £x in mortgage debentures and £y in ordinary or preference shares. You may say: " Why does the £x have to come from the Corporation, rather than from some other institution ? " The answer is that business can be, and sometimes is, split in such a way, but that usually the customer prefers to save time and trouble by obtaining both kinds of finance from one source.

In view of all these complications I suggest that the most relevant statistics are these: of the I.C.F.C.'s 460 cases outstanding at the end of May, 1954, about 50 could then be classed as comprising first-class property mortgages and nothing more. My impression is that the I.C.F.C. has never deliberately sought to devote its funds to this class of business, but on the other hand has not made a point of deliberately turning it away. It is rather a side line, and in my opinion should remain such, since the competition in this field is so keen that there seems little need for anybody else to join in.

The I.C.F.C.'s self-imposed limitations (which I have just described) have to a large extent prevented the Corporation from invading the preserves of other City institutions concerned with the provision of long-term finance. (i) In respect of issuing business, the *status quo* has been left almost undisturbed. (ii) In respect of taking up first-class property mortgages, the many institutions already in the field have been subjected to only a barely perceptible amount of extra competition. (iii) In respect of taking up other kinds of industrial securities, the more limited range of institutions which undertake this kind of investment has been subject to the possibility of extra competition only in so far as they want to participate in taking up relatively small new issues (since the Corporation has only very rarely interested itself in new issues larger than £200,000). In practice, the possible extent of such extra competition has been limited by the fact that the City institutions concerned (with the exception of the Charterhouse organisation, which has made such a success of financing private companies) have shown a marked preference for securities issued by companies whose shares enjoy a Stock Exchange quotation, and most companies wanting to raise under £200,000 do not fall into this category.[1]

(The attractiveness of quoted securities to the normal institutional investor often derives from their being more readily marketable than unquoted ones, but equally important is the ready availability of information on which to assess their suitability as an investment. This is shown by the fact that many institutions are ready to take up unquoted notes issued by companies such as I.C.I., whose other securities are quoted on the Stock Exchange, and whose affairs consequently receive wide publicity. Information about I.C.I. can for example be readily obtained from Moody's or the Exchange Telegraph investment service, from the Stock Exchange Yearbook, from members of the Stock Exchange, and from the financial press. Equivalent information about a company, none of whose securities are quoted, is readily available only when a stockbroker or issuing house sponsors such a company's securities, which however happens only occasionally. The peculiarity of the I.C.F.C., as I shall shortly explain, is that it in effect runs its own information service, and has thereby opened up a new field for institutional investment.)

The I.C.F.C.'s respect for other institutions providing long-term finance seems to me to have been on the whole excessively scrupulous. Even if one is only trying to fill a gap there is much to be said for a good overlap at the seams, and established institutions usually function more efficiently with some marginal competition to keep them on their toes.

THE I.C.F.C. AND THE BANKS

So much for the I.C.F.C.'s relations with other institutions providing long-term finance. Now, about its relations with its own shareholders, the banks. As regards the form of finance provided, there is no overlap at all between the banks and the I.C.F.C.: bank finance is repayable on demand, I.C.F.C. finance (if at all) only in annual instalments over twelve to fifteen years, in a lump sum after a comparable period, or by a combination of both methods. Nothing could differ more widely than the terms on which the banks and the I.C.F.C. do business with their clients. But does this imply that the *purposes* for which the two kinds of finance are provided are also distinctly different?

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[1] The cost of making a new issue of securities becomes proportionately heavier the smaller the size of the issue, which tends to deter small companies from " going to the public ". Moreover, the vast majority of small companies are in effect family businesses, where the controlling family is reluctant to allow the equity to get into the hands of the public and where in addition important legal advantages can be enjoyed by retaining the status of " exempt private company ".

On one view, of which Lord Piercy is an able exponent, the banks and the I.C.F.C. provide facilities which should be wholly complementary and never competitive. An article in the *Midland Bank Review*[1] quotes him as pointing out that bank advances:

> " . . . are not generally provided for permanent investment in buildings or other assets which involve a 'lock-up' ", and that though, " conventional rules of this kind are not observed by the banks to the point of extreme rigidity . . . it is fair to say that banks should not be regarded as an appropriate source of funds when what is required is permanent investment to provide fixed assets rather than an advance for floating capital ".

The article then goes on to explain that a customer of the I.C.F.C. may well require a joint arrangement with his bank and the Corporation, under which the former provides his short-term and the latter his long-term finance. There follow four very interesting examples, showing the form in which such tripartite agreements have been negotiated.

The article is indeed an invaluable source of information about the I.C.F.C., but I confess I am not entirely happy about the stress laid on the complementary nature of bank finance and I.C.F.C. finance.

The traditional view of bank lending is that each customer's account should be out of the red at least once a year, or at any rate that the account could *potentially* be out of the red once a year, in the sense that the nature and amount of the customer's assets would enable him, without great hardship, to repay his overdraft at certain seasons of the year, if his banker required him to do so.

Now there can be little doubt that the greater part of the banks' advances would be fully justified under the latter criterion: at any rate, I myself have never doubted it. But I do suggest that many advances are made which could not be justified on this strict basis, and though their total amount may be only a modest fraction of the total amount of all bank advances, it may well be large in relation to the I.C.F.C.'s resources. In fine, the lending practices of the banks are not such as to rule out the possibility of the banks and the I.C.F.C. operating in competition.

In fact there probably is a certain amount of competition, though naturally enough both parties are rather shy of admitting it. This point is impossible to prove conclusively, but it is surely significant that only 27 per cent. of the I.C.F.C.'s customers were introduced by the banks, even though the latter, as the I.C.F.C.'s shareholders, clearly have an incentive to pass on any business they prefer not to do themselves.

Nevertheless, we must not exaggerate the range of business on which the banks and I.C.F.C. are competitive. Almost all of the finance provided by the I.C.F.C. is redeemable over a period of upwards of twelve years or at the end of a comparable period, or is not redeemable at all. No banker would deliberately lock up his money for such a period. It would be inexpedient, to say the least, for a borrower to allow his banker to discover that his overdraft was £*x* in excess of the amount justifiable on the 'traditional' criterion I have mentioned above, and that some of this £*x* would have to be still outstanding twelve years hence. If however we replace the twelve years by a rather shorter period, I suspect that the banker might possibly acquiesce, and if the period were shorter still, say five years, the chance of winning his approval would be further improved.

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[1] The November 1946 issue.

Now there must in practice be many occasions where a businessman wants to finance new buildings or machinery, and where the sum he needs is sufficiently modest in relation to the earning capacity of his business to enable him to repay the money in say five years, out of taxed profits. Or perhaps we should rather say, since the future is so inscrutable to us all, that our businessman may reasonably be able to persuade himself and his banker that he has a sporting chance of being able to repay in five years. Why should he then prefer the I.C.F.C. to his bank? Surely a matter of taste, rather than necessity! In such a situation he can please himself, which I suggest is a good thing.

But though I myself may think it is a good thing to preserve these alternative facilities in such marginal cases, the banks may well think otherwise. In the secrecy of their boardrooms they may accuse even the I.C.F.C. of taking their money, on what might be considered rather favourable terms, and using it to steal their business! But whatever they may secretly think about the I.C.F.C., their actual behaviour as shareholders has been scrupulously correct. In the field within which the I.C.F.C. operates, its shareholders have given it very nearly a free hand. Moreover, the I.C.F.C. has in practice always been permitted to exercise its borrowing rights *vis-à-vis* the banks as and when required, even though the banks are under no legal compulsion to oblige.

If the banks do see any conflict between self-interest and public spirit in their relations with the I.C.F.C., I earnestly hope that they will continue to allow their public spirit to predominate. It is surely important to give businessmen at least the opportunity of paying for their long-term projects with long-term finance. If they are prepared to use short-term finance, and their bankers are prepared to oblige, well and good. But if they sleep more soundly in the knowledge that they are not at the mercy of short-term lenders (even sympathetic and obliging ones) they should surely be allowed to indulge their preference. For otherwise, it is more than likely that important projects of industrial improvement and expansion will be delayed or even dropped altogether.

THE LIMITS SET BY PROFITABILITY AND RISK

So far I have been considering the aspects of the I.C.F.C.'s business which are least novel, and which consequently resemble, or even overlap, the business of other institutions. Let me now say something of the aspects of the I.C.F.C.'s business which are more removed from what other institutions will tackle.

Undoubtedly the range of possible fields which the I.C.F.C. might attempt to invade is greatly reduced by the Corporation's firm intention to operate

> " on a strictly commercial basis. Thus the Corporation, as a business undertaking, must look to the profitability and prospects of an enterprise which seeks to borrow, and has to be satisfied that the management is competent and is following a sound policy . . . While it endeavours to keep its charges low and to offer reasonable terms, it does not provide capital at rates below the market level ".[1]

I myself believe that the resolve of the I.C.F.C. to pay its way is thoroughly sound. I am never enthusiastic about subsidising certain favoured economic activities by offering finance on better-than-market terms, and in this case my general attitude is reinforced by the conviction that the day that the I.C.F.C. ceases to pay its way it will lose its freedom of action. For let us suppose it makes losses with such laudable intentions that the banks or the Treasury are prepared to make good the deficit. Is it not likely that whoever was paying the piper would want to call the tune ? Is it not probable that all the I.C.F.C.'s ingenuity and enthusiasm would be stultified by remote control ?

The I.C.F.C.'s determination to pay its way means that it cannot accept more than a certain amount of risk, for even though by the nature of its business it has many eggs in many different baskets, one cannot here assume that the risk run by the eggs is actuarially predictable and therefore not risky in the aggregate. For many of the things which may endanger one egg will endanger them all. Take, for instance, a trade recession : this would affect not one but most or even all of the I.C.F.C.'s customers, so that unless the Corporation is careful whom it finances, and on what basis, it might well suffer serious losses.

A further consideration leading the I.C.F.C. to beware of accepting too much risk is what Lord Piercy calls " the institutional conscience " :

> " The personal investor was, on the whole, a tolerant sort of sleeping partner. Though no doubt disliking the loss of his stake, if that occurred, and highly interested in getting a fat return—which, after all, was what induced him to play—his fortunes as a rule did not depend upon the particular investment. It was often made out of surplus income ; and if the investment ceased to pay, or was lost, he took it philosophically. As against that, it is of the essence of good management of a financial institution that a high degree of conscience about the management of its funds shall permeate it from top to bottom. This factor—the institutional conscience—is one reason why an institution may be a less comfortable sleeping partner than the private person ".[2]

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[1] From the article in the *Midland Bank Review*.

[2] From an address on " The Provision of Capital for Industry ", to the Birmingham Centre of the Institute of Industrial Administration, October 11th, 1950.

The degree of risk run by the I.C.F.C. can be reduced by turning away business whose safety is not immediately apparent, or alternatively by investigating all *prima facie* propositions as thoroughly as possible and only then rejecting those whose safety cannot be reasonably established. The I.C.F.C. has opted wholeheartedly for the latter (and more ambitious) alternative. In order to see what this implies, let us consider the nature of the evidence on which the I.C.F.C. (or any other lender) has to " size up " a proposition.

Sizing up a proposition is of course not always a matter of considering it and saying " yes " or " no ". In the process of being considered, the proposition itself may undergo various changes at the hands of the I.C.F.C., very often with the customer's full agreement. There might well, for example, be a discussion of what amount of expansion the customer's business could reasonably stand at the time, in view of the size of his market, the availability of labour, and suchlike considerations on the one hand, and of financial considerations on the other. Under the heading of financial considerations it would be necessary to assess how much outside finance the customer's business could absorb without detriment to its gearing (if the new finance were at fixed interest) or to the customer's controlling interest (if the new finance were equity). In such discussions there need not be a conflict of interests between the I.C.F.C. and its customer. Both would be trying to assess " the right figure ". One party might be more cautious than the other, but the more cautious one would not always be the I.C.F.C. The I.C.F.C. might in some cases take the line, " Aren't you trying to do too much in one bite ? " but in other cases might take the line, " Aren't you spoiling your ship for a ha'porth of tar ? "

The I.C.F.C. is also in a position to give good advice on matters of detail: thus it might take the line, " You won't be able to operate on the scale you propose unless you strengthen your staff on the accounting (or sales) side ". It is also in a position to provide relevant information about such matters as market conditions at home and abroad, technical developments, production and office layouts, and so on.

The I.C.F.C. has to be especially competent at making financial sandwiches. Sometimes it is a matter of saying: " Of the £x you need, so much could appropriately come from us and the balance from your bank ": examples of this are given in the article in the *Midland Bank Review*. Or it may be a matter of saying, " We can't risk coming in unless you can raise £y of equity capital privately ".

But in due course the proposition reaches a stage where a decision has to be given one way or the other. The evidence on which the decision can be based falls broadly into four categories:

Accounting, i.e. historical data (preferably relating to the last ten or so years) on such things as turnover, costs, profits, assets and liabilities.

Technical, i.e. information about buildings and machinery (actual and projected), production lay-out, office arrangements, and the like.

Economic, i.e. information about markets, notably the markets in which the customer sells his output, but also to some extent about the markets in which he buys his labour and raw materials. (Information about markets involves *inter alia* identifying the main categories of sellers and buyers, discovering the marketing arrangements by which the sellers get in touch with the buyers, studying the relative merits of different varieties of goods sold in competition, estimating the possible impact of new technological methods, and so on.)

Human, i.e. evidence about the competence and integrity of the people who will be running the business.

Now the essential characteristic, as I see it, of a first-class property mortgage is that it can be provided on the basis of accounting data, supplemented by only such technical and economic data as are needed by a professional valuer for valuing the premises. Take, for example, an existing company, with no prior charges, wanting to borrow £x. Suppose its premises (existing and to be acquired) could (on an expert valuation) be readily sold for £$2x$ in almost any circumstances and can be mortgaged, need the lender inquire any further?

Sometimes propositions which fall somewhat short of being first-class property mortgages may nevertheless still be demonstrably safe on accounting data, supplemented only by an expert valuation. Suppose the directors of our company had wanted to borrow £$2\frac{1}{2}x$, instead of £x, but could point to general-purpose machinery standing in their balance sheet at £$2x$, in addition to their premises independently valued, on a conservative basis, at £$2x$, and a profit record such as to provide three-fold cover for the interest on a loan of £$2\frac{1}{2}x$.[1] Suppose, further, that the borrowing company can be legally restrained from incurring undue prior charges, from borrowing excessively from the bank or elsewhere, from stepping up directors' remuneration, etc., and that the lender can be given a first charge on the company's assets. (Thus the lender would, by purely legal devices, be protected to a considerable extent from dishonesty or gross incompetence on the part of the management.) Then most lenders would be content to put up the £$2\frac{1}{2}x$ without enquiring much further, happy in the knowledge that the risks of the enterprise would continue to fall almost exclusively on the existing shareholders.

A bargain of the above kind is, however, unlikely to be practicable in the case of a new, or rapidly expanding, or hitherto temporarily financed company. Here the provision of the new money, or a portion of it, would not be justified solely on the basis of accounting data, plus an expert valuation : the provider of the finance, or of some of it, would have to take a view on the whole field of technical and economic data, and on the human data. If then he decided to participate, it would be a matter of backing his judgment in interpreting these data.

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[1] By this I mean that the interest could still be paid out of profits if the latter (before tax) fell to one-third.

I would judge that in a majority of its cases the I.C.F.C. has to take some account of data of all the four kinds I have mentioned. It is indeed an essential (and novel) feature of the I.C.F.C. set-up that much trouble is taken to collect and utilise such a wide range of data. Even so, human and economic data are collected with difficulty and have to be interpreted with caution.

With regard to human data, the major difficulties are the strictness of the British law of libel, and the natural desire of possible informants to keep well clear of any avoidable unpleasantness. In consequence the I.C.F.C. (or any other lending institution) has in practice to rely mainly on the judgment of its own staff. However, though the I.C.F.C. has opportunities of meeting applicants at its head office (or at its branches in Birmingham, Manchester and Edinburgh) and also of visiting them on their own premises, it is not always easy to make up one's mind quickly about people who are studiously on their best behaviour.

Economic data are in practice collected mainly by systematically reading the financial and trade press, by discussing the prospects of the relevant industry with the appropriate trade association, and, subject to the applicant's permission, by talking to his suppliers and potential customers. This mass of material has to be interpreted in the light of common sense, rather than of any specialised technique. The results are of great value, but clearly fall far short of a reliable forecast of the applicant's future profits !

In brief, then, the I.C.F.C., by making expert use of all the kinds of data I have distinguished, is able to consider a range of propositions which otherwise would have to be turned down out of hand. But the range is a limited one. For by and large the Corporation sees no substitute for a good profit record and a reassuring balance sheet. It also likes to make use of the legal devices that I have mentioned above, designed to restrain the recipient of the finance from overreaching himself, and to protect the Corporation as much as possible from the results of bad faith or incompetence.

THE RANGE OF THE I.C.F.C.'S BUSINESS

That the Corporation has not been very active in financing small businesses is not therefore remarkable. Admittedly,

> " the test of profitability is not . . . applied in a rigid and uniform way. The Corporation is expected to provide money in amounts as low as £5,000, but loans of less than £15,000 show no profit at all, on a strict allocation of expenses (because the costs of investigation, negotiation, and administration do not decrease as the size of the loan decreases), and on a correct provision for risk of capital

> loss (because the small loans are generally more risky than the large). Furthermore, in order to encourage new developments within its field the Corporation undertakes certain investments where the risk is impossible to assess with the accuracy required for a strictly commercial investment, on terms which do not offer a reward corresponding to the risk even if the venture is successful ".[1]

It is apparent, however, that the Corporation has not in fact done much business in amounts of £15,000 or less at a time. Of the cases outstanding at the end of May, 1954, only 4 per cent. by value (though as much as 28 per cent. by number) had been negotiated for an initial amount of £15,000 or less. It may also be noted that not one of the I.C.F.C.'s customers is an unincorporated business.

Another difficult proposition for the I.C.F.C. to handle is that of a brand-new enterprise. This, Lord Piercy has pointed out,

> " reduces very broadly to two types of case: the first is where the promoters are putting up a reasonable part of the capital required. In such a case there is no difficulty—subject always to our being satisfied as to the merit of the project and the competence of the parties. We have provided capital in a number of such cases. This is a sound enough rôle for a financial institution of the pattern of I.C.F.C., because in this case there is a responsible technical partner and an insurance in the shape of the stake which that partner has in the business. The form of capitalisation of the business can, in such circumstances, be made to increase the degree of security for us, though in suitable cases we do not shrink from subscribing for ordinary shares.
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> " The other case, which is frequently raised—and I must say that it is one that we frequently meet—is that of people who want to start a business but have no capital. The most common case is that of the man who wants a few thousand pounds; but we have had applications for borrowing as much as £100,000. The case is one which cannot altogether be dismissed. There is an argument of this kind: an established company may have a board of directors with very little shareholding among them all, who yet for practical purposes exercise absolute control of very large resources. Why cannot such a position be established *ab initio?* Chiefly, I suppose, because starting *ab initio*, creating and organising a new business, if it is on any scale, is a very difficult task, and calls for exceptional qualities. This I take to be one of the lessons of experience, and bitter experience at that. To encourage such an enterprise is only reasonably safe where the financier knows so much about the business and the people that he can assess the risk of success and where, added to this, he is able to give some attention to the development of the enterprise. Financiers in such a situation are not

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[1] Raymond Frost, *loc. cit.*, p. 199.

> non-existent, but they are scarce; and it will still be true that the promoters of such enterprises will mostly find themselves thrown back on getting the first few thousands from their personal friends and acquaintances before they can interest a general finance house ".[1]

What I have said so far will have enabled you to assess with some accuracy the kind of business unit with which the I.C.F.C. has most of its dealings. It is not a sole trader or a partnership, and not often a new business. On the other hand, it is only rarely a public company with a stock exchange quotation. In brief, the typical client is an established private company[2] needing a sum of money (probably between £15,000 and £200,000) the whole amount of which cannot be borrowed on a first-class property mortgage.

THE I.C.F.C.'S TERMS

What are typically the characteristics of the bargain which the I.C.F.C. strikes with its typical customer? Let me consider first the question of fixed-interest versus equity finance.

If a provider of capital runs risks (and the I.C.F.C. typically takes *some* risk) he will naturally require extra remuneration. This could be provided either in the form of a higher rate of fixed interest or of an equity participation—i.e. a participation in profits. It would seem that Lord Piercy holds that the latter method is in principle the better one where it can be arranged.

> " Some disadvantages of loan capital must be borne in mind. Thus the interest has to be paid in bad times as in good. In this the loan is in contrast with ordinary share capital. . . . Fixed charges for interest appear very onerous in times of depression and they exert a numbing effect on costing. . . . What is really needed in this matter is a prudent judgment as to the amount of borrowing, long term and in-and-out, that can be safely carried in good times and bad.
>
> " This brings us to the question of share capital. The share is essentially a partnership device; and the share in the limited liability company both defines and limits the stake of each of its partners. In a partnership, the partners may make differing contributions. You may have partners undertaking the full-time management of the business combined with sleeping partners whose contribution simply is providing capital. I said providing capital; but along with that goes another function, carrying the risk. Management and risk-bearing are the two elements needed to constitute a business.

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[1] From an address by Lord Piercy on " Finance for Industry " to the International Association of Accountants, February 5th, 1947.

[2] Or occasionally a public company without a Stock Exchange quotation.

> " Now in the small or medium size business which needs more capital, there is a great deal to be said for bringing in a partner on the basis of an investment in shares—always provided that the basis is equitable as between the existing and the incoming shareholders, sweeping up in this question the various points such as control, division of profits and the like ".[1]

It is, however, not always easy to arrange to supply equity finance to private companies, where shareholders are not widely dispersed, and where in consequence (i) control lies with the shareholders rather than with the salaried management, and (ii) this control is exercised fairly decisively by the holders of 51 per cent. of the shares. There is not much possibility of a complicated balance of power between the management and shareholders, and among the shareholders themselves, such as may occur in a large public company. Consequently, an outside institution like the I.C.F.C. commonly faces the dilemma that a 51 per cent. equity participation would be unacceptable to its customer, since it involves " handing over the business ", while a less-than-50 per cent. participation must to a considerable extent leave the I.C.F.C. at the mercy of the existing shareholders. The dilemma does not admit of any standard solution, and indeed the I.C.F.C.'s bargains are characterised by the variety and ingenuity of their adaptation to the circumstances of the particular customer. I will, however, risk a few generalisations:

(i) The I.C.F.C. is prepared to go some way in accepting its reward for risk in the form of a higher rate of interest. One would of course not in any case expect the I.C.F.C. to lend at the current gilt-edged rate. Even blue chip debentures always have a current yield fractionally higher than the Consol rate, and investors commonly need an extra bribe (often in the region of 1 per cent. per annum) to get them to take unmarketable securities. How much more than this would the I.C.F.C. be prepared to take by way of risk premium? It is rash to generalise, but I have little doubt that 2 per cent. per annum would be regarded as a rather high risk premium, to be taken only where for one reason or another it was not possible for the Corporation's recompense for risk bearing to be in the form of an equity participation.

(ii) In an appreciable number of cases the I.C.F.C. takes some form of participation in profits, but only rarely is the finance provided wholly by taking up ordinary shares. Of the 460 cases outstanding at the end of May, 1954, only 14 involved exclusively the holding of ordinaries, but another 12 involved options on ordinaries and in a further 72 cases the I.C.F.C.'s interests included, *inter alia*, ordinary shares.[2]

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[1] Also from Lord Piercy's Birmingham address, quoted on page 225 above.

[2] There were also a few cases of the I.C.F.C. holding participating preference shares.

(iii) The I.C.F.C. never seeks voting control. On the contrary, it deliberately prefers to be a sleeping partner except in very special circumstances (e.g. when its interest is in default) or in respect of certain "reserved" subjects (such as directors' remuneration, new borrowing, or investment projects of more than a certain size). However, in order to keep in touch with its customers, the I.C.F.C. sometimes appoints a director to the board of the companies it finances, particularly where the company itself wishes the Corporation to contribute some particular expertise to the deliberations of its board. In 135 of the 460 cases outstanding at the end of May, 1954, the I.C.F.C. had taken the power to appoint a director, but in only 53 cases had a director actually been appointed.

You will see that the I.C.F.C.'s way of doing business gives it only a minimum of legal protection against sharp practice and incompetence. The system works as well as it does only because of the care the Corporation takes to avoid doing business with knaves or fools, and because of the continuing friendly relationship which the Corporation seeks to maintain with its customers. Except for cases of first-class property mortgages and other particularly safe investments, the Corporation's customers supply periodic accounts or statements (either monthly or quarterly) to the Corporation and receive from time to time visits from the Corporation's officials. The job of these officials is to discuss and advise, never to instruct, and they are often able to provide useful information on such matters as conditions in overseas markets, export credit facilities, and official controls and regulations both here and abroad. A symptom of the happy relationship between the I.C.F.C. and its customers is that the I.C.F.C. customer often comes again: of the 460 cases outstanding at the end of May, 1954, no fewer than 155 had involved finance from the Corporation on more than one occasion, and in some 40 cases the customer had come back more than twice.

There is, however, one aspect of the I.C.F.C.'s relations with its customers about which I confess I am not completely happy. This is the Corporation's avoidance of the practice (not infrequent among long-term lenders) of contracting to vary with the Bank Rate the rate of interest charged.[1] The Corporation's attitude was originally excusable, if not defensible, in that in 1945 it may have seemed that the 2 per cent. Bank Rate would last for ever, and anyway it was never laid down clearly how (if at all) the rate which the Corporation paid on its borrowings from the banks would change if the Bank Rate changed. But after Mr. Butler came to power there was no longer ground for illusions on these matters. For soon the Bank Rate was increased, and with it the interest rates charged by the banks both on the I.C.F.C.'s new borrowings and (to a lesser extent) on its outstanding borrowings. The rise in the interest charges on outstanding borrowings (" old money " as it was called) was particularly unwelcome to the I.C.F.C., which sought, at any rate for a time, to restore the balance between its outgoings and receipts by availing itself of all seemly opportunities for revising contracts with customers so as to add an extra half per cent. or so to the interest rate they had to pay. My impression is that these tactics, however much they may have been in accord with City practice, probably lost the I.C.F.C. a lot of well earned goodwill.

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[1] I am not suggesting that the Corporation's lending rate should change by the same percentage per annum as the Bank Rate. The former might be made to change by some agreed fraction of 1 per cent. per annum for each 1 per cent. per annum change in the latter.

CONCLUSION

In its first eight and a half years of existence, the I.C.F.C. has subscribed £38 millions in sums averaging about £55,000 at a time, and allowing for repayments and losses, nearly £28 millions were outstanding at the end of the period. Those who were expecting that the I.C.F.C. would set a more spectacular pace should remember:

(i) That throughout the post-war period, contrary to my own and many other people's predictions, the supply of private money seeking investment in private companies has continued to be fairly ample, at any rate in relation to the amount of capital expenditure such companies have been able or inclined to indulge in.

(ii) That a certain amount of custom has been choked off by the Capital Issues Committee.

(iii) That, given the I.C.F.C.'s resolve to pay its way, it has inevitably found it desirable first to consolidate a secure position, from which to prepare an advance, in preference to launching out into unfamiliar country with untested methods and an untried organisation.

However, though the achievement so far is in the circumstances highly creditable, there is no sign of complacency at 7 Drapers' Gardens. There is on the contrary a pervading sentiment that the job is only just beginning to get under way. There are, it is thought, vast opportunities in British industry for profitable capital expenditure, the finance of which will be beyond the heavily taxed resources of the private investor. I think we can take it that there will be no lack of ingenuity on the I.C.F.C.'s part in attempting to make good any deficiency of finance on terms which are acceptable to the borrower while still allowing the Corporation to continue to pay its way.

The University, Nottingham.

Statistical Calculations of Tax Burdens[1]

By A. R. Prest

In recent years there has been a number of attempts in this country, the U.S.A., and elsewhere to estimate the redistributive effects of all taxation. Our objects in this paper are to examine the logical assumptions behind these calculations and to try to assess their validity. Some of the estimates have been more ambitious than others and have tried to deal with the expenditure, as well as the revenue, side of government activity. Although our arguments are of general applicability to both sides of the accounts we shall not specifically refer to the expenditure aspects, except in Section V. We shall, moreover, confine ourselves to the principal direct and indirect taxes, such as income taxes and excise taxes, without going into the ramifications of other forms of taxation. This is partly because these taxes are usually the most important, but also because they are on the whole simpler to analyse and therefore anything we have to say will most probably apply *a fortiori* to other taxes.

In I we shall try to summarise the ways in which the authors of these papers have grappled with their problems and the justifications they give for their assumptions and methods; in II and III we shall look closely at indirect taxes; in IV we shall turn to direct taxes, and in V we shall offer some general reflections on these calculations.

I

It seems fair to say that these various authors usually assume that income taxes rest where they are put, and hence the burden is reckoned to lie on the factors of production, and on the other hand that indirect taxes are passed forward and hence the burden is estimated to be on the consumers of a product.

Thus, for instance, Sir Herbert [Lord] Samuel in his classic paper of 1919[2] said:

> " I have followed all previous investigators in assuming that the taxes on commodities are paid by the consumer ".

In the Colwyn Committee Report[3] it is explicitly stated[4]:

> " We make a general assumption that the burden of taxation is borne as intended, i.e. that direct taxes are borne by the payer and

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[1] I have to thank Professor Sir Dennis Robertson, Professor Milton Friedman and Messrs. P. T. Bauer, A. D. Roy and A. J. Youngson for valuable comments on an earlier draft.

[2] " The taxation of the various classes of the People ", *Journal of the Royal Statistical Society*, Vol. LXXXII, 1919, p. 49.

[3] *Report of the Committee on National Debt and Taxation*, Cmd. 2800, 1927.

[4] *Op. cit.*, p. 74.

> that indirect taxes are shifted by the payer and borne by the consumer ".

The most comprehensive study in this field in the U.K. is that by Barna.[1] On the indirect taxes we are concerned with he is very explicit:[2]

> " Indirect taxes are assumed to raise prices by their amount and by no more. This is so if the supply of the commodities or services taxed is elastic relatively to their demand. It has been proved by statistical analysis that the demand for certain commodities, e.g. sugar, tea, alcohol and tobacco, is inelastic. This is likely to be the case of all Customs and Excise duties but more will be said below on the incidence of protective duties ".

And on p. 13 he says:

> " There is evidence that the prices of the taxed commodities move with changes in the rates of tax ".

It is only fair to add, however, that he does have rather more hesitations about taxes (such as local rates) on production in general.

In the case of direct taxes, it is argued[3] that the burden is on the payer because:

> (*a*) The distribution of gross personal income has remained roughly the same in this country for long periods. It is also much the same as in other capitalist countries;
>
> (*b*) The share of wages in the national income is invariant to tax changes over the years.
>
> (*c*) The gross long-term rate of interest is also stable over long periods of time.

Similarly in a recent study of the social services in this country[4] it is stated:[5]

> " We have assumed that direct taxes are borne by factors of production and indirect taxes are borne by consumers of the commodities taxed ".

Broadly speaking, American writers have made similar assumptions. Great care has, however, usually been taken with the allocation of corporate income taxes, and Adler[6] for instance, computes alternative distributions based on differing assumptions about shifting backwards and forwards. Musgrave *et al*[1] are in general extremely careful to specify the nature of their assumptions but seem to take it as axiomatic that excise taxes are shifted forward to their full extent.

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[1] *Redistribution of Incomes through Public Finance in 1937.*

[2] *Op. cit.*, p. 141.

[3] *Op. cit.*, pp. 14–15.

[4] A. T. Peacock and P. R. Browning, " The Social Services in Great Britain and the Redistribution of Income " (*Income Redistribution and Social Policy*, ed. by A. T. Peacock).

[5] *Loc. cit.*, p. 155. The authors do, however, add " some of these assumptions are very shaky, particularly those relating to the allocations of indirect taxes " (*ibid.*).

[6] J. H. Adler (and E. R. Schlesinger), " The Fiscal System, the Distribution of Income and Public Welfare ", in *Fiscal Policies and the American Economy* (ed. K. E. Poole), p. 414.

II

We must now ask which of the reasons given for these assumptions in respect of indirect taxes can be rejected out of hand, which are actually or potentially legitimate and subsequently, whether they are logically complete.

Before we start, however, it may be as well to state the fundamental issues as precisely as possible. Authors of these studies are attempting to estimate the effects of taxes on the distribution of real income in the private sector of the economy. This, in turn, involves estimates of changes in money incomes and market prices. In order to simplify the problem, it must surely be assumed (although this is rarely explicitly stated) that the supply of all factors is completely inelastic. If we ignore international trade and productivity complications, this enables us to postulate a given national product in real terms and enables us to concentrate on the distribution of that product firstly between the public and the private sector, and secondly within the private sector. Clearly the effects of removing indirect (or direct) taxes may be very different depending on whether one only looks at the income and price effects in the industry concerned and whether one confines oneself to the short period (in the Marshallian sense) or not. However, we shall leave this issue open for the time being and return to it in detail later.

Let us now examine the reasoning about indirect taxes. We can see straightaway that two of the arguments put forward are worthless. The argument that the incidence (we shall henceforth use this as a shorthand term for redistributive effects) is borne as intended is obviously light-weight. It may often be impossible to know the intentions of Government in respect of any particular tax change. Moreover, how does one aggregate Government intentions ? For the question which is being asked relates to the incidence of all existing indirect taxes which may be the sum total of tax changes by a large number of Governments at a large number of different points in time. And even if one were certain of Government intentions, this is no guide whatever to actual results, which is what the authors of these exercises should presumably be concerned with.

Then one comes to the argument that, in practice, whenever indirect taxes are raised or lowered by the Treasury, immediate price adjustments are made upwards or downwards by traders. But even if this were *always* the case in practice—and I am not aware of any empirical study which shows it to be so—it would be beside the point in this particular context. For it would only show what happens when *marginal* tax changes were made. Lowering the tobacco tax by 10 per cent. or introducing a 15 per cent. duty on, say, cheese, may have entirely different price effects from those which would prevail if the whole structure of indirect taxes were removed.

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[1] Musgrave, Carroll, Cook & Frane, " Distribution of Tax payments by Income Groups; a Case Study for 1948 ", *National Tax Journal,* IV (1951).

We must now turn to the arguments about elasticities of demand and supply. First of all, it should be observed that the correct theoretical condition for prices to be raised exactly by the amount of the tax is that supply must be infinitely elastic, except in the limiting case when demand is completely inelastic. Therefore, Barna's condition that supply should be elastic relatively to demand is necessary, but insufficient. Furthermore, his argument from statistical analysis is inaccurate (in the sense that statistical analysis cannot *prove* anything about the parameters of demand functions) and incomplete (in the sense that knowledge is needed about the supply function as well as the demand function).[1]

But what are the conditions necessary to justify the assumption that supply is infinitely elastic? First of all, in the case of any one commodity, it means that the length of time considered must be something longer than the Marshallian short period in which, by definition, supply is less than perfectly elastic. And there are obviously plenty of commodities such as mineral and agricultural products where the period of clock time which must pass before the long period conditions emerge must be very lengthy indeed.[2] Secondly, it must be remembered that the authors of these calculations are not dealing with one commodity alone, but with the whole range of commodities subject to tax. Suppose we postulate that there is a general excise tax covering *all* goods and services. If prices are to be raised exactly by the amount of the tax, this would in turn imply perfectly elastic supply of all goods and services. But how can thère be perfectly elastic supply of all goods and services if the supply of factors has zero elasticity? And, as we have already suggested, how is it possible to discuss this problem of the distribution of real income unless an assumption of this kind is made? Therefore it must surely follow that an implicit assumption in these calculations is that indirect taxes cover only a small proportion of the whole range of goods and services—an assumption which, it must in all fairness be said, was much more tenable in the pre-war period to which Barna's enquiry relates, than it is today.

But suppose we ignore for the moment all these difficulties implicit in the condition of perfectly elastic supply and let us imagine that in fact the removal or imposition of a particular tax does change the price of the commodity by exactly the amount of tax. We must now ask what demand conditions are implicit in the assumption that only the price of the taxed commodity changes and that therefore prices of commodities and factors in other industries are unchanged.

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[1] Except in the case when demand is perfectly inelastic. But this involves further difficulties (cf. p. 241, n. 8).

[2] The authors of these various studies do not seem to have been fully aware of this. A. H. Conrad, for instance, argues that his calculations relate to the *immediate impact* of taxes on the distribution of incomes (A. H. Conrad, " Redistribution through Government Budgets in the U.S. 1950 ", in *Income Redistribution and Social Policy*, p. 179).

III

To explore this issue, we shall take a number of possible cases[1] and try to examine the consequences of each. We shall continue to assume throughout that the supply of factors is completely inelastic. To start with we shall also assume that the Government spends its tax receipts on goods and services (assumed, for simplicity, to be exempt from tax) and not on transfer payments. We shall later see what happens if this assumption is changed.

For our first case, let us assume that monetary arrangements are sufficiently elastic to permit Government spending to rise contemporaneously and to the same extent as a rise in tax receipts. Then, irrespective of whether private spending is lagged on income or not, we should, given our assumption of inelastic factor supplies, expect the general price level (inclusive of indirect taxes) to rise. For we are in effect postulating an increased volume of spending impinging on a given supply of resources.

For our second case we may take the situation where Government and private spending are lagged on receipts by one period. Then if indirect taxes are imposed we should not expect to find a rise in the general price level either in the first period when the Government surplus of receipts over expenditure increases, or in the second period when its expenditure rises to the extent of the tax increase. For in the first period total expenditure is maintained at its previous level as neither the private nor Government component alters: in the second period, the Government component increases by precisely the amount of the fall in the private component. Therefore, in these conditions the general price level remains unchanged.[2]

The important point which comes out of this comparison is that a rise in indirect taxes may or may not be accompanied by a rise in the general price level depending on which case is considered. Moreover, a similar conclusion holds if we assume that the Government does not use these tax proceeds to buy goods and services thus leaving the same real income available to the private sector.[3] If[4] we take first the situation when the tax receipts are handed out simultaneously as transfer payments, we should expect the price level to rise if these transfers are spent immediately and to remain constant if spent with a one-period lag. If, second, we assume that the Government impounds the proceeds, the budget surplus increases, and therefore the overall level of spending and the general price level tend to fall. Finally, if we assume that other taxes are remitted at the same time and to the same extent as the rise in indirect taxes, we should expect the general price level to be unchanged if private expenditure is lagged on income by one period and to rise if it depends on current income. Therefore we must conclude that in neither the case where private real income falls by a given amount nor in that where it remains unchanged, can any single conclusion about the movement of the general price level be reached.

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[1] The number of cases one could take is clearly infinite. We select a few in order to show the sort of issues involved.

[2] This seems to be the model used by Rolph (cf. E. R. Rolph, " A Proposed Revision of Excise-Tax Theory ", *Journal of Political Economy*, Vol. LX, 1952).

[3] In the previous cases private real income was reduced by the Government's purchase of goods and services (taking period 2 as the relevant period for comparison in our second case).

[4] Assuming again an elastic supply of money.

What is the importance of this argument for calculations of the incidence of all indirect taxes in a country? We have already seen that, in effect, these calculations in their customary form imply a perfect elasticity of supply of any taxed commodity. But in order to postulate that the redistributive effects can legitimately be measured by confining one's attention to price changes of the taxed commodity only, certain assumptions have to be made about the general level of demand. Unless it is assumed that the general level of demand (and hence the general price level inclusive of taxes) rises there must be price effects, and presumably further redistributive effects, at other points in the system. For if prices of the taxed commodities are deemed to rise to the full extent of the tax, and no more and no less, and if other prices are assumed to remain unchanged, the general price level has to rise. If the general price level does not rise, but it is still assumed that prices of taxed goods rise by the amount of the tax then other prices must be deemed to fall. Therefore, if calculations of incidence take only the price changes of taxed commodities into account, implicit assumptions are made not only about the elasticity of supply of these particular goods, but also about the overall level of demand.

To illustrate more specifically, let us take the case where demand for the taxed commodities is completely inelastic. Then if the overall level of demand remains unchanged, the increased expenditure on the taxed commodities must entail decreased expenditure on other goods and services and therefore their prices and hence, presumably, factor prices, must fall. If, on the other hand, due to, say, simultaneous Government spending of tax receipts, the overall level of demand rises then it is possible for the demand conditions for other commodities to be unchanged.[1] If, to take another case, the demand for the taxed goods has unit elasticity, expenditure on them will be unchanged and, if therefore total demand is unchanged so will be the expenditure on non-taxed goods. But in this case a smaller quantity of taxed goods will be sold at a higher price than before; therefore resources will be driven out of the taxed industries and, given our assumptions of inelastic factor supplies, must find their way into the non-taxed industries thus increasing supplies and forcing down prices of goods and factors.

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[1] Even in this case, when the general price level is unchanged, there may still be price changes in respect of individual goods and services (and hence possible effects on the distribution of real income) unless the increases and decreases of demand for each individual item exactly offset one another.

There are two possible lines of defence against our criticism. One is to say that the assumptions about overall demand which are necessary in order to validate the practice of these authors are, in some sense or other, the most reasonable assumptions to make. The other is to say that demand conditions are of no consequence and such things as price effects in other industries can safely be neglected in any practical calculations.

The only study I know in which it is clearly recognised that assumptions have to be made about demand conditions is that by Musgrave *et al.*[1] The particular assumption made there is that as indirect (or for that matter, direct) taxes increase, there is a contemporaneous equal reduction in other taxes which take the form of the same proportionate reductions in each person's real income. It is argued that with this assumption it is possible to neglect " budget effects ". However, even this is not enough. In order to confine the price effects of indirect taxes to the prices of the taxed commodities, it has to be assumed that private expenditure is related to current and not to past incomes. If this is not the case, the level of demand will tend to remain unchanged and hence, given price rises of the taxed goods, price falls must occur elsewhere. Is it really more reasonable to contend that private expenditure depends on current rather than past income ? To say the least, one must return a verdict of " unproven ".

But even if this were true, it still has to be asked, why one device for abstracting from changes in the budget surplus or deficit should be more valid than another. It is surely just as legitimate to assume that the Government spends the tax receipts as that they are compensated by other tax reductions. Once it is recognised that there is no such thing as *ceteris paribus* when there is a large change in indirect taxes (and this applies even if the Government takes no action to change other taxes or current expenditure; for then the budget surplus must increase and this will in turn imply some monetary adjustment such as debt retirement) it is clear that no one assumption about the overall level of demand is more justifiable than another.[2]

Finally, is the argument acceptable that it is a fair approximation to neglect price changes outside the taxed industry ? It is hard to see why this should be so. The implicit assumption of perfect elasticity of supply must in general rule out the confinement of these investigations to very short-period effects. And, in any case, it is not easy to see why the price reactions in the taxed and non-taxed industries should be far displaced in time. Nor is there any convincing evidence that the redistributive effects due to the latter price changes must be much less important than those due to the former in conditions when indirect taxes play a large part in budgetary receipts and these in turn are an appreciable fraction of National Income.[1] The argument that it is reasonable to limit oneself to price changes in the taxed industry, and no other, seems a very poor foundation on which to rest such an imposing edifice of calculations.[2]

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[1] *Loc. cit.* There is also a short discussion of this point by Peacock and Browning (*loc. cit.*, p. 154).

[2] The arguments by Musgrave *et al* on this point (*loc. cit.*, p. 8) are unconvincing. Whether the same legislative body deals with revenue as with expenditure is a matter of institutional arrangement; and to suggest that the redistributive features of the expenditure side are unimportant is surely wide of the mark under modern conditions.

IV

Now we can turn to the arguments used to justify the treatment of direct taxes and examine their validity and completeness.

The assumption which is obviously necessary to justify the treatment usually accorded in the U.K.[3] to direct taxes, i.e. that factor incomes are reduced by exactly this amount and no more, is that factor supplies to any given industry are completely inelastic.

A good deal of time was spent by the Colwyn Committee in producing reasons to justify this assumption[4] but as they were effectively exploded more than twenty-five years ago by Sir Dennis Robertson[5] I do not propose to spend time on this point.[6] Nor do the points raised by Barna[7] command a great deal of confidence. For they seem to ignore many other possible explanations. Thus, it *might* be true that any long-term stability of the distribution of gross income points to income taxes not being passed forward. But could it not also be explained if other changes (e.g. effects of other Government revenues and expenditures, growth of education, changes in powers of trade unions, etc.) have been such as to offset any tendency to a greater dispersion of gross income due to the forward shifting of direct taxes ? Similar considerations would seem to apply to the other points he raises.[8]

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[1] It may of course be true that some of these effects will be distributionally neutral either when taken alone or when combined with others.

[2] It does not seem an exaggeration to claim that Marshall was on our side in this general issue. During his discussion of the effects of taxes and bounties under differing conditions of supply (*Principles*, Bk. V, Ch. XIII) he remarks (p. 466 n.): " This method of enquiry is not applicable to a general tax on all commodities; for . . . (it cannot) . . . be assumed that the marginal value of money to the individual remains approximately the same after the tax has been levied as it was before ". (Our brackets.)

[3] As we have already seen, American authors are often cautious about the treatment of Corporation Taxes.

[4] Cmd. 2800, *op. cit.*

[5] " The Colwyn Committee, the Income Tax and the Price Level ", *Economic Journal*, XXXVII, 1927.

[6] A good account is given of these arguments by D. Black, *The Incidence of Income Taxes*, Chapters 2 and 3.

[7] See above, p. 235.

[8] It could, of course, be argued that the price of a commodity would not rise after imposing a direct tax on an industry provided that demand were completely elastic, irrespective of whether supply were completely inelastic or not. But perfect elasticity of demand would be incompatible with the assumptions relevant to indirect taxes—either the general assumption of perfect elasticity of supply or the limiting case of completely inelastic demand.

There are in fact very good reasons for arguing that in the long run income taxes must have effects on the relative supplies of factors to different industries and therefore (assuming a given pattern of demand) on relative prices. Levying a proportional income tax must make risky or unpleasant industries less attractive to labour. To persuade people to work in coal-mining, for instance, may require a wage of, say, £10 a week, whilst the average wage in other industries may be £8. An income tax levied at 25 per cent. will reduce the differential to 30s. instead of £2, and may therefore (assuming that " income effects " are not strong) tend to drive labour out of coal-mining and hence reduce output.

Similarly, there have been many demonstrations that a proportionate and *a fortiori* a progressive income-tax may tend to drive capital away from risky industries. But this is a complicated subject and we must hasten to add that there are various exceptions.[1]

In general, therefore, it must follow that if the calculations of the incidence of income-taxes are to have any real validity, they must relate to relatively short periods of time—though, of course, not of precisely the same length for each industry. Otherwise it can hardly be assumed that the supply of factors will be completely inelastic to any given industry.

But this assumption is in complete contradiction to that made in the case of indirect taxes. We have already seen that to make those calculations valid, it was necessary to assume perfect elasticity of supply of any taxed commodity. Therefore it must be concluded that calculations of the incidence of direct and indirect taxes are based on conflicting and contradictory assumptions. In one case the assumptions only have validity in the Marshallian short period; in the other only in the long period.

Nor is this all. We have already shown that if price changes due to indirect taxes are to be confined to the taxed commodities particular assumptions have to be made about the speed of reaction of either the Government or the private sector to changes in receipts (e.g. that the Government must increase expenditure simultaneously) in order that the overall level of demand may be deemed to increase. But if it is postulated that direct taxes result only in reduced factor incomes then precisely the opposite conditions about the overall level of demand are implied. If the general price level remains unchanged, the absence of price changes in the taxed industries is consistent with there being no price changes elsewhere. If, on the other hand, the general price level rises, there must be price changes elsewhere.[2] Therefore, the

[1] A recent discussion of this subject is by P. Streeten, " The Effect of Taxation on Risk-Taking ", *Oxford Economic Papers*, Vol. 5, No. 3, October 1953.

[2] There is a further difficulty about what is meant by " elsewhere ". If the income-tax system covers every form of activity there is no such thing as elsewhere, and therefore there is a flat contradiction in assuming that the Government spends its tax receipts contemporaneously and that the only redistributive effect is via a reduction in factor incomes. In fact, however, income taxes never are completely universal and there always is some element of " elsewhere ".

assumptions which were necessary to justify the confinement of the calculations about indirect taxes to price changes of taxed goods are clearly not the same as those necessary to simplify the calculations of the incidence of direct taxes. The direct conflict between the assumptions of perfect elasticity of supply of commodities and that of perfect inelasticity of supply of factors implies a further conflict between the assumptions about the overall level of demand in the two cases, if the calculations are to be restricted to the price effects, on commodities and factors, in the industries concerned. Nor, finally, is there any obvious reason to believe that " other industry " price effects can be neglected in this case any more than in the indirect-tax case.

V

We now have to ask what conclusions follow from the indictment raised in the preceding paragraphs.

First of all, do our arguments apply to all attempts to assess the incidence of any taxes ? Clearly, the answer is " No ". We have not criticised efforts to estimate the incidence of *marginal* changes of either direct or indirect taxes. For if the changes are purely marginal it may well be possible to neglect the overall level of demand. Furthermore, if one is interested in the incidence of one tax or one group of taxes only, it is perfectly reasonable to make this calculation in relation to the time period in which the difficulties of calculation are minimised —and therefore perhaps calculate some kind of long-run incidence for indirect taxes and short-run for direct. Nor do our criticisms necessarily mean that *in principle* the incidence of all direct and indirect taxes taken together is unknowable; it is simply that the methods adopted so far contain basic logical incompatibilities.

It might well be argued, however, that in fact no other calculations of the incidence of all direct and indirect taxes are statistically possible in the foreseeable future, that, for instance, if one cannot say that indirect tax effects are assumed to be entirely on the prices of the taxed commodities and direct tax effects entirely on the rewards of the factors immediately concerned there is really no alternative statistical calculation. Therefore it might be said, if these methods are rejected, these calculations are, in fact, even if not in principle, killed stone dead.

Suppose this reasoning be accepted. Two lines of argument then suggest themselves. Firstly, how important must the loss be reckoned ? Second, is there some alternative device which would in fact tell us much of what we want to know ?

To answer the first question, we have to seek for the *raison d'être* of these calculations. This was a point which troubled Edwin Cannan many years ago when he gave evidence before the Colwyn Committee.[1]

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[1] *Report of the Committee on National Debt and Taxation,* Minutes of Evidence, Vol. I, 1927, pp. 65–7.

He boggled at the idea that any suitable comparison could be made between the distribution of incomes before and after tax and roundly declared:[1]

" I think that enquiry is a will-o'-the-wisp myself. I cannot help it if the House of Commons has asked you to do it ".

And about Lord Samuel's calculations of 1919 he was even more emphatic in saying of them:

" Yes, absolutely useless I think ".[2]

Clearly, if a comparison were being made between income distributions in the absence of all taxes and after allowing for the effects of these taxes, Cannan's views would be absolutely right. No one, I take it, is very much interested in the sort of situation which might prevail in a society without any government at all.

However, it can be argued[3] that the comparison is not between the income distribution after tax and the no-tax position but rather with the income distribution which would have prevailed if Government intervention had been neutral in its distributive effects. But the difficulty about this line of approach is that one does not know what gross (i.e. pre-tax) incomes would have been in this latter case. It is clearly not legitimate to estimate the income distribution which would prevail after tax if taxes were distributionally neutral, by deducting " neutral " amounts (however calculated) from the gross incomes which actually prevail under the existing taxation arrangements. Therefore this particular justification for these calculations seems invalid.[4] And it is not therefore entirely obvious how much is lost if our arguments are deemed conclusive and these calculations rejected out of hand.

However, if one is interested not so much in a comparison between two distributions in the same year, but rather in the relative distribution of incomes after tax in two or more years (or places), there is a method of approach which is free from the objections we have raised. If one classifies income recipients by size of income groups then one can estimate the sum received in the two years by each group, after deduction of taxes directly assessed on income and (if one wants to allow for the redistributive effects of Government expenditure too) after adding Government transfer payments. Subsequently one can deflate this change in net income received by each group by a retail price index appropriate to that group.[5] Thus if the top income bracket were to have an increase in net incomes from £2,000 to £4,000 and the bottom income group a decrease from £100 to £50 but prices for the former had risen by 50 per cent. and for the latter had fallen by 20 per cent., then one could say that the true gain for the top group was from £2,000 to £2,667 (approximately) and for the bottom group the loss was from £100 to £62·5.[1]

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[1] *Op. cit.*, p. 66. [2] *Op. cit.*, p. 65. [3] Cf. Barna, *op. cit.*, p. 11.

[4] This point is recognised by Barna (*op. cit.*, p. 24) but he assumes that it can be neglected " in so far as the vertical distribution of incomes in different industries is not very different ". No justification, however, is offered for this assumption.

[5] Obtainable presumably from the family budget data needed for the conventional method of " allocating " indirect taxes. There would, however, be complications in a price index for saving.

A device of this kind avoids the awkward difficulties discussed above; for instance, price effects of a change in indirect taxes, whether narrow or widespread, will be reflected in the retail price index. Similarly, changes in factor rewards must be reflected in net incomes received.

Obviously, many difficulties exist in this kind of procedure. All the old ones of allocating corporate undistributed profits, taxes and indivisible Government expenditures remain. And some new ones are added such as the lack of any single device (comparable to those which can be used for summarising the properties of an income distribution in a single year) for summarising the changes between years. It might also be argued that our suggestion only shows the combined effect of Government and private measures on the distribution of incomes and that therefore we have no means of isolating the influence of Government. To this the reply seems to be: is it really so important to know anything more? If one can show that, in some sense or other, income distribution has become more egalitarian between two dates, and it is a confirmed aim of policy to make it still more so, then the Government can take the appropriate steps in that direction. Nor need there be any undue difficulty in deciding what is meant by "appropriate", for, as argued above, we have not made any indictment of calculations of the redistributive effects of *marginal* changes of particular taxes.

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[1] Since the above was written Mr. A. T. Peacock has pointed out to me that some calculations on these lines have been made by Mr. Dudley Seers (see *The Levelling of Incomes since 1938*, p. 56).

The Delegation of Authority to Spend[1]

By LUCIEN FOLDES

SECTION I: INTRODUCTION

Many decisions to spend money are made, not by those who own it or have ultimate control over its use, but by agents who are employed to act for them. Such agents often delegate their powers to sub-agents, and these to sub-sub-agents, until a person is reached who actually decides. This is the practice in both public and private administration; and even in the household the power to spend is commonly delegated.

In all such cases the principals have to take two decisions: They must determine to what extent they will part with their power of deciding how every penny shall be spent; and they must define the scope of the agents' authority to part with the power in their turn. Agents must take similar decisions regarding their sub-agents. This essay is concerned with some of the factors which enter into such decisions, and with various administrative arrangements by which the discretion of agents may be regulated.

The problem of discretion in spending has often been considered in connection with public administration. In this country the main body of literature consists of Committee reports,[2] writings on constitutional law and history,[3] and works by public administrators,[4] while systematic discussion by academic economists in works on public finance is relatively rare.[5] There is an extensive continental literature on "science des finances" or "Finanzwissenschaft", to which little reference is made in writings in English, which deals with this problem.[6]

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[1] My thanks are due to Professor Sir Arnold Plant, who suggested the subject of this paper, and gave me great help and encouragement in its preparation.

[2] For a review, see B. Chubb, *The Control of Public Expenditure.*

[3] For the present law, see Sir T. Erskine May, *Parliamentary Practice*, chs. XXIII–XXVIII; H.M. Treasury, *Notes on Government Organisation No. 6, Parliamentary Supply Procedure*, and *Notes for the Guidance of Accounts Branches.*

[4] *Inter alia*, H. Higgs, *The Financial System of the U.K.;* Sir E. Hilton Young, *The System of National Finance;* A. J. V. Durell, *Parliamentary Grants;* A. H. Marshall, *Local Authorities: Internal Financial Control.* Recent British writings include: Sir E. Bridges, *Treasury Control;* Institute of Public Administration, *Financial Control: Its Place in Management;* Institute of Municipal Treasurers and Accountants, *The Place of Finance in Public Administration.*

[5] But see C F. Bastable, *Public Finance;* R. G. Hawtrey, *The Exchequer and the Control of Expenditure;* also J. R. Hicks, *The Problem of Budgetary Reform.*

[6] For a review, see K. Heinig, *Das Budget.* Other recent foreign works include the new *Handbuch der Finanzwissenschaft*, Vol. I; H. Laufenburger, *Traité d'Économie et de Législation Financières;* The Reports of the Hoover Commission on the Organisation of the Executive Branch (U.S. Congress, 1949), esp. "Budgeting and Accounting", and Appendix F entitled "Fiscal, Budgeting, and Accounting Activities"; O. Bakker, *The Budget Cycle in Public Finance in the U.S.A.*; U.N. Sales, XVI, Fiscal, 1952, No. 3, *Government Accounting and Budget Execution.*

Writers on budgetary control in private business appear to have given it little detailed consideration, despite many similarities between the problems of expenditure control in large firms and in government. Again, though economic analysis is clearly relevant to this problem, it is not normally considered in texts on pure or applied economics.[1] There would appear to be a need for an " economic " approach to the problem of discretion in spending, and for an analysis of it which can be applied to both public and private administration.

SCHEME OF ESSAY

This essay must needs be selective in its discussion of these wide questions. We shall begin, in Section II, by setting out some of the practical problems which arise in framing regulations to govern spending by agents. Section III will present an analysis of the main underlying influences which enter into the determination of the scope of discretion in both public and private administration. In Section IV this analysis will be applied to some of the problems raised in Section II, and some of the factors will be discussed which must be taken into account in finding solutions of these problems in particular cases.

For simplicity of exposition, we shall consider only organisations whose structure, like that of British central government, includes a principal (Parliament, or in a firm the shareholders or Board, according to the problem under consideration), a chief agent (Treasury, managing director) and a number of sub-agents (heads of departments). The distribution of authority will, of course, vary from one such organisation to another, and this fact is not excluded by our assumption. Different structures can be dealt with by analogy.

SECTION II: ADMINISTRATIVE ARRANGEMENTS AFFECTING DISCRETION

Administrative arrangements which actually define the scope of discretion in spending may be considered under three headings, namely (1) the control of expenditure proposals, (2) discretion conferred by the terms of the grant, and (3) the enforcement of regulations.

(1) *The Control of Expenditure Proposals*

Some of the problems which arise under this heading are whether proposals involving expenditure are to be passed from the top of the organisation downwards, or from the bottom upwards; whether, if the latter method is adopted, they should be subject to systematic revision, and if so at what level; and whether, if subordinates are given considerable freedom in the figures that they put into their budgets, that should be a reason for giving them greater latitude in their execution or whether, on the contrary, they should be made to adhere to them all the more closely.

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[1] Some discussion of this or related problems is contained, *inter alia*, in F. H. Knight, *Risk, Uncertainty and Profit*, ch. X; in the first two papers in Sir Arnold Plant, *Some Modern Business Problems;* and in G. F. Thirlby, " Notes on the Maximisation Process in Company Administration ", *Economica*, 1950.

A problem which is much discussed, especially by French writers, relates to the treatment to be given to supplementary estimates, or revised budgets. In some private firms, departments are encouraged to submit revised budgets rather than be bound by incorrect figures or deviate widely from original budgets without any official revision. But in central government, where revenue cannot easily be adjusted to expenditure during the financial year, it is generally held that supplementaries must be discouraged, especially where they contain requests for more funds, and not merely for their reallocation among purposes; moreover it is considered that the accuracy of original estimates will suffer if revision is made too easy.

(2) *Discretion Conferred by the Terms of the Grant*

The terms of the grant may give an agent discretion either because they do not specify in detail how every penny is to be spent, or because they allow divergence from the figures laid down. Such discretion may relate to prices, quantities, or total costs of particular goods or classes of goods; but it is the last of these which will concern us mainly. The following problems will be considered further in Section IV:

(*a*) The principles of classification: Budgets are normally divided into classes and sub-classes, and some measure of adherence to the provision made in each category is usually expected. Therefore the method by which expenditures are classified will affect the scope of the discretion possessed by agents. For example, should expenditures be classified by types of inputs bought or by types of outputs produced ?[1] Or should the classification be according to departments and sub-departments ?

(*b*) Virement and excess spending: At the same time as a method of classification is adopted, it is necessary to determine to what extent it is to be binding on departments. Should a department have no power at all to exceed any figure in its budget without reference to the principal ? Or is it to be allowed to practise " virement ", either on its own authority, or on that of the chief agent; that is to say, is it to be allowed to overspend one class if it makes a corresponding saving on another ? Finally, is it to be allowed to overspend its budget altogether without reference to the principal ?

(*c*) Contingency Funds: The inclusion in the budget of unappropriated funds for contingencies is an alternative way of granting discretion. What are the relative advantages of the two methods ?

(*d*) Length of budget periods and transfers between periods: The problems here are to fix the length of the budget period, and to decide whether departments are to be allowed to carry grants over from one period to another, and whether they are to have discretion as to the rate at which they spend money during the budget period.

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[1] British writers have called these two methods " subjective and " objective ", respectively; but some American writers mean by " objects " what British writers mean by " subjects ", so the terminology is best avoided. For recent discussion, see the report of the Crick Committee on the Form of Government Accounts, (Cmd. 7969/1950), and Hoover Commission, *op. cit.*

(*e*) Appropriation of receipts: Finally, it is necessary to lay down a rule governing the treatment of receipts collected by departments. Is the expenditure of a department to remain constant in the face of changes in receipts, unless the whole budget is revised? Or is each department to have the power to use its receipts like an independent business?

(3) *The Enforcement of Regulations*

Nothing will be said here of the important problems which arise under this heading, such as the relative merits of pre-audit and post-audit, of internal and external audit, and of test and complete audit.[1] Some method of enforcement must normally exist; if it does not, or is ineffective, a further source of discretion is open to subordinates.

SECTION III: THE OPTIMUM SCOPE OF DISCRETION

(1) *Reasons for Restricting Discretion*

A person who owns or controls the use of funds is usually reluctant to give subordinates discretion to decide how they are to be used, for by doing so he runs the risk that their decisions will conflict with his preferences. Briefly, the arguments against discretion are these:

(*a*) First, an agent may deliberately use funds in a manner which is contrary to the wishes of the principal. This constitutes misappropriation when money is diverted to other official purposes, as distinct from actual fraud or " malversation " when it is used for private purposes.

(*b*) In the absence of deliberate misappropriation, an agent may misuse funds owing to an incorrect appraisal of the principal's preferences.

(*c*) A third reason for reluctance to give discretion is fear of the agent's incompetence, even though his identification with the principal's aims may be complete. Sometimes delegation takes place because the agent does a job better; but often it is necessary in spite of the fact that he may do it worse.[2]

(*d*) These objections to discretion apply whether there is one agent or several; but in the latter case they give rise to some special complications. A principal is likely to be particularly reluctant to permit delegation to sub-agents, who may not be selected by him or be in contact with him, and whose competence and loyalty he may therefore be unable to assess. Moreover, it is notorious that departmental officials are more closely identified with their departments than with an organisation as a whole, even if they happen to know what is best for the whole organisation. This " worm's-eye view ", coupled with the interdependence of departments, may provide a reason for limiting discretion.

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[1] For recent surveys, see works quoted on page 246, footnote 6.

[2] See Plant, *op. cit.*, " Centralize or Decentralize ? "

For some purposes departments are competitive, for others complementary. Thus all spending departments compete for funds, and spending as a whole competes with accumulation of reserves, debt redemption, tax reduction, etc. On the other hand, departments are complementary where one collects the revenue accruing from the activities of another. In all these cases, there will be some interdependence between the optimum uses of funds in different departments, and it may be necessary to retain power in the hands of a common superior in order to secure co-ordination. To allow any one agent to redistribute expenditure within his department as conditions change may prevent overall adjustment between departments.

(2) *Reasons for Granting Discretion*

In spite of these objections, discretion frequently has to be granted. The reasons may conveniently be classified as follows:

(*a*) First, the pressure of work upon the principal may be too great to permit of his doing it all; and when he delegates work, he must normally also delegate some discretion, because of the cost of reference back when conditions change. Thus one reason for allowing virement is to avoid the presentation of numerous " token " supplementary estimates requesting permission to re-allocate funds. The cost of reference back includes the additional work involved for both principal and agent, as well as the actual cost of communication.

(*b*) The second reason is to obtain the advantages of specialisation in making decisions. It may be best for the principal merely to express his preferences in general terms by laying down standing orders, and give his expert agents wide powers to determine actual outlays of money.

(*c*) It is a familiar argument that close regulation, however necessary, may be the enemy of efficiency, whereas discretion can be used to provide an incentive to economy. Regulations may result in one of two undesirable practices, depending on the nature of the regulations and the character of the official who administers them. On the one hand, if it is possible to give satisfaction merely by adherence to regulations, an administrator may feel no need to improve his methods. On the other hand, if regulations are inconvenient, his attention may be diverted from their enforcement to their circumvention, and the means adopted are likely to entail a maldistribution of resources.

The relevance of these points to the case for discretion in spending is well illustrated by the evidence given by Sir Charles Harris to several committees between 1918 and 1926 in favour of a scheme for decentralisation of Army administration.[1] He maintained that the system whereby each unit of the Army draws provisions, stores and equipment according to a scale of entitlement laid down by a specialist department should cease. Any scale which catered for all units of a certain type must, he argued, make provision of any item to the extent required by the unit which needed the largest amount of that item, and there would therefore be waste in all the others. No effort would be made to economise in units which had more than enough, since all that was required was to keep within the regulations; on the other hand units which were relatively short of supplies would devote great efforts to obtaining more than the scale provided. Instead of this system, he proposed that the specialist departments should become purveyors and not regulators, and that unit commanders should be granted money credits with which they could, within certain limits, "buy" items which they required from these departments. Any savings were to be used for the benefit of the units at the discretion of the Commanding Officers, who could thus obtain greater freedom in their expenditures by the exercise of economy. He also maintained that financial efficiency should be taken into account in deciding on the promotion of officers. In this way many regulations were to be swept away, the remaining ones being enforced by more frequent and thorough inspections. The theoretical interest of this argument is not diminished by the fact that it was ultimately found that the savings to be obtained at unit level were very small, and that the scheme was abandoned for this reason, among others.

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[1] See National Expenditure Committee, 1918, 7th Report; Lawrence Committee on Army Expenditure (Cmd. 2073/1924), of which Harris was a member; and Committee of Public Accounts, 1925.

(3) *The Effect of Uncertainty*

The existence of uncertainty has of course been assumed throughout the previous argument; but it requires explicit consideration, since its incidence largely determines the relative importance of the various factors which affect the optimum degree of discretion.

It is possible to distinguish four main relevant types of uncertainty, namely:

- i The principal's uncertainty as to his own future preferences.
- ii The agent's uncertainty as to the principal's preferences, current or future.
- iii The principal's uncertainty as to the agent's competence and loyalty.
- iv Uncertainty of principal or agent as to opportunities, i.e., as to possible transformations within the firm or through the market.

The effect of the first three types will generally be to make the principal reluctant to delegate. The uncertainty of opportunities will have the same effect where it creates a need to provide for flexibility in the allocation of resources among departments, and also where subordinates are less competent to take decisions involving such uncertainty. In general, the principal will be more reluctant to allow a decision to be delegated to any given level of the organisation, the greater the chance that a mistake will be made at that level, and the greater the probability of loss (in terms of profit or utility) if a mistake is made. Thus proposals to use given sums for capital expenditure or for non-recurrent expenditure, or for purposes which it could be in the private interest of some member of the organisation to promote, usually have to be considered in detail at a higher level than proposals to spend equivalent amounts on ordinary recurrent expenditure, because of the greater chance of error. But once the nature of a problem has been thoroughly understood, and standing orders have been laid down to prevent the main types of error, discretion can more readily be granted to subordinates.[1]

The existence of uncertainty makes it necessary to provide in the budget for flexibility in the allocation of funds (e.g., by virement, or by the use of contingency funds), in order to keep marginal utilities or rates of return from allocations of funds as nearly equal throughout the organisation as possible under changing conditions. Since it will be possible to deal only with relatively major changes at the centre, discretion will have to be given in the remaining cases to enable adjustments to be made within the framework of each department.

The need for flexibility will be greatest in three cases. The first arises where goods which are close substitutes are placed in separate classes of expenditure, and opportunities are uncertain. Thus Gladstone pointed out to the Committee of Public Accounts of 1862 the need to allow transfers " which, in the main, represent the question between the use of different materials in the construction of ships ".[2]

The second case occurs where the organisation's demand for a class of goods is very inelastic, so that total expenditure on it will fluctuate greatly with changes in buying prices. When these are uncertain, there may be considerable economy in consolidating the provision in the budget for several such classes of expenditure, especially when their amounts are likely to fluctuate inversely, or at least independently.

The third case occurs when the optimum outlay on a particular class of goods varies with the amount received from sales of goods of that class, or from other sources, and where the amount of these receipts is uncertain. This point will be considered further in Section IV(*e*).

It may be argued that flexibility in provision for complements is necessary, as well as for substitutes, owing to the need to provide complements in relatively fixed proportions. Thus if a rise in food prices has rendered the Vote for Army provisions insufficient, it is little consolation to know that there is more than enough money to pay, clothe, and equip the soldiers, unless there is a power of virement. But on closer inspection this turns out to be merely another variant of the argument for consolidation of uncertain expenditures; for in a case where the Vote for provisions is excessive, but the others are just right, there seems to be no reason to allow the surplus funds to be distributed among the Votes in order to finance an expansion of the Army as a whole. The case is otherwise, however, where funds are not initially allocated on the basis of careful assessment of utility or profit, but on the basis of arbitrary lump sum allocation to departments, or "rate rationing".

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[1] See P. Wilson, " The Administration Chart ", in Plant, *op. cit.*

[2] Ev. 1606.

This concludes the theoretical exposition of the factors which influence the optimum degree of discretion in spending. In conclusion, it should be pointed out that the theory applies as well to business as to public administration, and the differences of practice between them can largely be stated in terms of it. The main causes of these differences are three: First, that in business conducted mainly for profit there is likely to be much less conflict about preferences than in public administration. Secondly, that in business it is easier to combine discretion with incentive, by linking an agent's remuneration and promotion to the profit which he makes. Thirdly, that in business receipts and expenditures fluctuate closely together, so that more discretion can be given to an agent whose department pays its own way. The last point is further discussed below.

SECTION IV: APPLICATION OF ANALYSIS

Some of the problems raised in Section II will now be considered in relation to the analysis which has been set out. The problems are all connected, but they will be considered one by one, and an attempt made in each case to give some indication of the points which would have to be taken into consideration in arriving at a solution in a particular case.

(*a*) *On what Principles should Expenditure be Classified?*

First, the method of classification cannot be decided without taking into consideration the extent to which virement and excesses are to be allowed. Therefore, if it is desired to facilitate transfer of funds between any two types of expenditure, they must be placed accordingly in the framework of classes and sub-classes into which the estimates are divided. Thus it will be desirable to place expenditures close together where there is substitution, or a gain from consolidation, or where the possibility of transfer acts as an incentive; and to separate them where there is likely to be conflict between principal and agent as to their desirability.

Secondly, it is stated by some authors[1] that the classification of expenditure should follow the administrative hierarchy. This principle is clearly sensible, since any other method is likely to lead to unnecessary multiplication of relationships of authority, to needless communication, and to divided responsibility. However, it is not entirely unambiguous. For one thing, the administration chart can itself be adapted to meet the needs of the system of budgetary control. For another, two or more alternative lines of administrative delegation may co-exist in one organisation. Thus in the case of the controversy about Army organisation, the choice was between classification of expenditure according to the administrative departments in charge of pay, supplies, stores, works, etc., and classification according to military formations.

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[1] e.g., by G. Schanz in the article "Budget" in *Handwörterbuch der Staatswissenschaften,* 4th ed., Vol. 3, p. 101.

Thirdly, the estimates should give the principal the information needed for choosing between alternative policies. And fourthly, it is desirable that the classification adopted for estimates should also be convenient for the presentation of accounts.

Clearly there is likely to be some conflict among these requirements. For instance, the classification which is best for purposes of choice may be such as to make the accounts inaccurate or expensive to prepare. In such cases it is necessary either to sacrifice one method, or to have a double (or multiple) system of estimates, or accounts, or both.

One example of such conflict relates to the classification of the Army estimates. Sir Charles Harris favoured classification of expenditure by " outputs " (i.e., by formations and units), rather than by " inputs " (pay, supplies, etc.), not merely as part of his scheme of decentralisation to unit level, but also because it would give Parliament better information on which to judge the desirability of maintaining particular units and stations. However, appropriation accounts prepared on this basis would have involved the maintenance of unit accounts, and also of accounts of stores in terms of value, which in the case of warlike stores would have been very arbitrary.

(*b*) *Virement and Excess Spending*

We shall now take the method of classifying expenditures as given, and consider to what extent an agent should be allowed to deviate from the figures set out in the budget. It will be convenient for the present to consider only two methods of giving discretion: the power of virement, and the power to incur excess expenditure for a department as a whole.

Any figure inserted in the budget will fall into one of three categories, (leaving aside the relatively rare cases where under-spending is prohibited):

i Where no over-spending and no virement is allowed without reference upwards. For instance, a civil government department may not exceed its Votes without reference to Parliament, and it may not exceed its sub-heads, or undertake " any increase of establishment, of salary, or a service, or any additional works or new services "[1] without reference to the Treasury.

ii Where virement of part of a grant is allowed on departmental authority, but an overall excess is not. (Where there is free transfer between two grants they can be regarded as one.)

iii Where an overall excess is allowed on departmental authority.

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[1] Treasury Minute of April, 1868.

The factors which determine into which category a particular expenditure should fall are of the same kind as those which determine the overall degree of discretion to be given to an agent, for the problem of virement and excess expenditure is the problem of discretion writ small. Some of the arguments relating to virement will be considered below; here we shall merely consider one aspect of the problem.[1]

There is a theoretical argument against the use of grants which are absolutely watertight compartments, like Civil Votes, except in the case of expenditures whose amount can be accurately predicted. For most ways of spending money are substitutes to some extent; besides, every classification of grants is bound to be somewhat arbitrary, so that some expenditures which are included in separate categories may be more closely connected than others which are classified together. There is therefore a case, even in government, for a general, though closely restricted, right of transfer (and perhaps even of excess spending), supplemented by a further right of transfer in special cases. However, in the case of central government the complication of even a simplified system might well be too great to make it practically usable.

A much less formal system, which meets this theoretical requirement, is to treat an estimate, not as a maximum, but rather as an attempt to sum up in one representative figure a probability distribution of expenditures. Executives are then allowed to transfer funds or to exceed their estimates, either within definite limits or " up to a reasonable amount ", without reference to superiors, provided they make prompt reports and are able to justify their actions. Some large firms use a system of this sort for their ordinary recurrent expenditure, apparently with success; however, it is clearly unsuitable for use in government.

(*c*) *Virement vs. Contingency Funds*

The third problem raised in Section II was that of the choice between the two main methods of providing for flexibility in budgets, namely virement and contingency funds.

Where a given degree of discretion is to be placed entirely in the hands of a department, without any need for reference to higher authority, there is relatively little to choose between the two methods. It comes to much the same whether a department has ten grants of £100 each, with power to transfer 5 per cent. of any grant to any other, or whether it has ten grants of £95 and a contingency fund of £50, though it may be more convenient to use one method or the other in particular cases.

More important issues arise when it is sought to unite flexibility with central control, which are best illustrated by means of an example. The

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[1] For some discussions of virement see L. v. Stein, *Lehrbuch der Finanzwissenschaft*, Vol. I, p. 314; P. Leroy-Beaulieu, *Science des Finances*, Vol. II, ch. IV; R. Stourm, *The Budget*, chs. XIII and XVI; B. Földes, *Finanzwissenschaft*, p. 73; Durell, *op. cit.*, pp. 283, *et seq.;* Schanz, *loc. cit.*, p. 101; Young, *op. cit.*, ch. VII; Marshall, *op. cit.*, p. 85.

Committee of Public Accounts of 1862 considered at length the problem of virement in relation to Army and Navy Votes. Each of these departments had a number of Votes, classified according to the main types of services bought (pay, stores, supplies, works, etc.). Virement between the Votes of the same department was allowed if Treasury authority were obtained, but this control was not very effective, as it operated *a posteriori* only, and it was widely thought that the power had been abused, especially by the Admiralty.

Two main plans were considered by the Committee. The scheme which was adopted, and is still in operation, was that the power of virement should remain, but that Treasury sanction should be sought in advance, even though the precise sum needed might be unknown, and that retrospective Parliamentary sanction should be required.

An alternative suggestion was made by W. G. (later Sir William) Anderson, the head of the Finance Division of the Treasury,[1] who was supported before the Committee by Gladstone, and by the representatives of the War Office. He argued that the power of virement should be abolished, for the following reasons: (1) It was inadequate as a provision for contingencies, since a " service of urgent necessity may arise, and no provision exist for meeting it ".[2] (2) Unneeded surpluses were disposed of by transfer to avoid surrender, and the departments felt a " right of property " to their surpluses. (3) It undermined Parliamentary control. (4) It made possible the systematic use of " popular " Votes, like those for pay, to subsidise the less popular Votes.

Anderson proposed that Parliament should provide for flexibility by making a grant for contingencies which should be added to the Treasury Chest Fund, and not to any fund under departmental control. This Fund was to be used to meet all unavoidable excesses, while all surpluses were to be surrendered, as in the case of Civil Votes. An annual statement was to be presented to Parliament, together with a request for replenishment of the Fund.

This method would have had several advantages. It would have provided a definite centralised reserve for contingencies, and thus made possible some flexibility between the expenditures of the two departments. It would have increased Parliamentary control to some extent by limiting to the amount of the Fund the sum which could be allocated by the Executive without Parliamentary authority. Also it would have strengthened Treasury control over departments, and prevented the abuses then associated with virement.

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[1] Described by Sir Charles Trevelyan as " the ablest accountant in the public service " (Seymour Committee on Army Estimates, 1850, Ev. 6146). It was he who introduced double-entry appropriation accounting into the Army and Ordnance Departments, and gave the evidence to the Committee of Public Moneys of 1856 which provided the framework for the Exchequer and Audit Departments Act of 1866.

[2] Appendix 4, by W. G. Anderson.

There are however some possible objections to the scheme. Perhaps the most serious is that the Treasury might have administered the Fund so strictly that the departments would have tried to inflate their estimates in order to provide for uncertainty, so that there would have been duplication rather than consolidation. The argument that transfer must be permitted because the Army, or Navy, is " all one service " is not as strong as it seems, for Service Department Votes are probably complementary rather than competitive in the short period, and as we have shown, the argument for flexibility between complements is merely a case for consolidation of uncertainties. It is also a doubtful contention that the uncertainties within each department are likely to be so great that no Fund which Parliament would consent to vote could suffice to consolidate the provision for them. As for the argument that the power of virement operated as an incentive to economy, it is clear from Anderson's objections that he did not attach much importance to it in this case. Actually his scheme appears to have been rejected mainly on account of the traditional fear of placing unappropriated funds in the hands of the Executive, although it would have brought the Service Department Votes into line with the Civil Votes, which are watertight compartments but which can, under certain circumstances, be supplemented from the Civil Contingencies Fund.

We are not concerned here with the correctness of this decision, but rather with the great theoretical interest of the controversy. Circumstances will alter cases, but the same considerations will be relevant whenever there is doubt in an organisation as to the best means of providing for flexibility while retaining some measure of control at the centre.

(*d*) *Transfers between Periods*

The problems connected with the length of the budget period, the transfer of grants between periods, and the control of rates of expenditure will not be discussed in detail. The case for and against discretion can largely be analysed under the theoretical headings set out in Section III. For example, if the length of the period is given, the main arguments for insisting on the surrender of unspent balances at the close of each period are (i) the greater simplicity of accounts, (ii) the need for central control, which includes (iii) the need for periodical overall redistribution of funds, taking into account *all* alternative uses, and (iv) prevention of the accumulation of balances in the hands of agents. On the other hand, the main reasons for allowing transfers between periods are (i) to facilitate substitutions between the expenditures of different periods, (ii) to reduce the temptation to spend balances in order to avoid surrender, and (iii) that the enforcement of surrender involves detailed control, which it may be desirable to avoid, e.g., in the case of grant-aided bodies (though as the result of recent changes in policy, more regard is paid to unspent balances in fixing grants-in-aid, and grants which are not fully expended are sometimes short-issued[1]). However these arguments clearly cannot be considered in isolation, for the transfer of funds between periods is only one among several alternative means of providing for flexibility.

(*e*) *Appropriation of Receipts*

Both governments and business concerns have to decide whether departments should have freedom to use the receipts collected by them for their expenditures, or whether they should be paid into a central fund, out of which all expenditures must be met. Cash will, of course, in either case be used where it comes to hand; the problem is whether departmental expenditures should fluctuate with departmental receipts or not.

The system by which many governments used to assign the produce of individual taxes to the expenditures of departments is of course obsolete, though some remnants of it still exist. In most countries, even the miscellaneous receipts collected by spending departments have to be surrendered, and the gross expenditure of departments is fixed by the legislature. This system was introduced in this country in 1848, but was abandoned in the years after 1881. Under the method now in force, estimated Extra Receipts such as fees and receipts from the sale of stores are, for the most part, deducted from the estimates of expenditure under each Vote. Votes are taken net, and give authority for the estimated receipts to be appropriated in aid of expenditure. Where realised receipts exceed expectations, the surplus may not be used unless a Supplementary Estimate is presented, whereas deficits must be made up by curtailing expenditures. However, virement may be practised between the Votes of a Service Department with respect to receipts as well as expenditures, if Treasury sanction is obtained.

Two claims are made for this system. The first is that the inclusion of Extra Receipts in the revenue would cause it to be overstated. However, one could just as well argue, with Thomas Gibson Bowles, that the present system understates the revenue.[2]

The second claim is that the system gives departments an incentive to realise these Extra Receipts.[3] Since Votes are taken net, a department is likely to obtain a larger gross sum, the more it can contribute itself. Also, it is argued that the system tends to encourage such transactions as " turning over " stores by reselling them to Colonial Governments, which would be neglected if the receipts had to be paid into the Exchequer. But there are several answers to these arguments. First, even if Votes were taken gross, the Treasury could make some allowance for receipts in its annual review of the Estimates, taking into account on the one hand the sum a department promised to realise in the coming year, and on the other hand whether it was adhering to its estimate for the previous year. Secondly, as Sir E. Hilton Young wrote, the revenue departments do collect the revenue without any special inducement.[1] Thirdly, there is no guarantee that the incentive will operate at the right time; a department which has an ample Vote in a particular year may well regard its disposable surplus stores as a nest-egg for the future. Fourthly, the system generally leads to underestimation of receipts. Finally, it is not clear that the level of spending of an administrative department of the government should vary in the short term with small changes in its receipts; the present system introduces an additional (and unnecessary) source of uncertainty into the preparation of the estimates.[2] All this suggests that there is much to be said for reverting to the earlier method, which is preferable in principle, if not in the way it was administered at the time.

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[1] See Second Report from the Select Committee on Estimates, 1953–4, Paras. 11–12, and Memorandum No. 1.

[2] *National Finance in 1908 and After.*

[3] Treasury Minute of June 1881. See also Sir C. Harris, " Army Finance ", two lectures given in 1924–5 to the Army Class at the London School of Economics.

In private business, the solution of the problem must depend largely on the organisation of the firm. Consider a firm which has a number of widely dispersed production points, which buy their factors locally, and a quite separate selling organisation, which directs sales from the centre (e.g., a commercial airline). It seems probable that in these cases unplanned variations in miscellaneous revenues gathered in at the production points would not be allowed to affect their expenditure, which would be carried out in accordance with the overall budget agreed by both the sales and production sides of the business. This is not to say, however, that the overall budget might not be a " flexible " budget relating expenditure at production points to variations in revenue from sales.

The case is otherwise in an organisation which is in effect a confederation of virtually autonomous firms (like General Motors Corporation), or in a single firm which has several departments, each engaged in both buying and selling, like a department store with a separate buyer in charge of both the buying and selling of each department. In this case the argument for letting expenditures vary with receipts is much stronger. The optimum level of purchases in a department does normally vary with the level of sales, over a period. If the variation is considerable, and if it is desirable that it should take place within the same budget period, there is a strong case for allowing departmental expenditures to fluctuate with receipts, though not necessarily by the same amount. Moreover, the manager of a department can be given an incentive by connecting his pay or promotion with the profit he makes. But even here there are reservations, arising out of the interdependence of departments. First, the best use of surplus profits earned in one department may be to invest them in a different department, or in securities outside the firm. This is very likely to happen when market conditions are changing rapidly. Secondly, there may be interdependence in production or marketing between two departments. Thus one department in a store may be a "loss leader" for others. In all these cases there will have to be some central supervision over the use of receipts; and it may be considered best to make short-period expenditure budgets independent at least of small or erratic fluctuations in receipts.

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[1] *Op. cit.*, p. 52.

[2] cf. Committee of Public Accounts, 1881. Memorandum submitted by Sir T. Erskine May.

The conclusion suggested by this discussion is that the case for allowing the expenditures of a department to vary with fluctuations in its receipts is stronger, (i) the more nearly autonomous the department, (ii) the more closely it is desired that changes in expenditures should be associated with changes in receipts, (iii) the longer the budget period, and (iv) the stronger the incentive which can thereby be given (subject to the reservations made earlier in the discussion).

SECTION V: CONCLUSION

Several examples have now been given of the problems which arise in defining the scope of discretion in expenditure, and some of the points have been indicated which enter into a solution. These problems have of course been considered before, generally in attempts to answer particular questions arising from time to time in various governments; but there has not, I believe, been any attempt at unified discussion in the light of an analysis derived from general economic and administrative theory. There has been little attempt at a systematic formulation of the factors to be taken into account whenever these same problems arise, whether in public or private administration, or of the way in which varying administrative requirements can be met by adopting alternative devices for regulating discretion. The examples used in this paper have been drawn mainly from public administration, and in the discussion of the treatment of departmental receipts some criticisms of Treasury policy were incidentally suggested; but these cases have been chosen mainly to illustrate the conflicts which arise in general in framing regulations to govern the delegation of authority to spend.

London School of Economics.

Book Reviews

The Great Inflation 1939-1951. By A. J. BROWN. Oxford University Press. 1955. xiv + 321 pp. 30s.

This book combines economics, statistics and mathematics, and may therefore be properly regarded as econometrics. Nevertheless, it does not present the forbidding appearance of a typical number of *Econometrica.* The major reason for this is of course that *Econometrica* normally contains very little econometrics, but a subsidiary reason lies in the simplicity of Professor Brown's mathematics and his exclusion of all technical material on statistical sources and methods. The book is, therefore, readable.

Two major inflationary mechanisms are distinguished. Firstly, there is demand inflation which occurs in an economy of flexible prices; that is an economy where prices of most goods and factors are demand- (market-) determined. In this case the general price rise may be viewed as the working of the multiplier process when income and output can expand in money terms, but not in real terms. Secondly, there is the wage-price spiral which occurs in its pure form where all prices are cost-determined. Thus the difference between the types of inflation is that in the first, prices are pulled up by purchasers, while in the second they are pushed up by sellers.

Professor Brown gets down to a study of demand inflation in Chapter III after an elementary theoretical introduction and a world-wide survey of the phases of inflation from 1939 to 1951. This chapter, coming early in the book, displays a readiness to explain economic theory in very elementary terms (a readiness which appears to have evaporated somewhat later on) and begins with the A B C of the multiplier. Within a few pages, however, Professor Brown has constructed a few consumption functions and is showing that in the major belligerent countries, wartime consumption lay below the level indicated by extrapolation of the pre-war relationship. Thus the limitations of the demand approach are shown, and Professor Brown turns to the price-wage spiral. Incidentally, to take the Government deficit as part of the multiplicand is to assume that the multiplier effect of a balanced budget change is always zero, which is as misleading as the statement that it is always unity.

The three chapters on the price-wage spiral are excellent, particles of fact, theory, and common sense being combined in cunning Brownian movement. There seems to be, however, one sin of omission: in discussing the relation of the spiral to the multiplier, Professor Brown considers only how the price-wage spiral is financed. There is little discussion of why and how prices and wages are cost-determined—of the extent to which excess demand is a necessary condition. A more detailed examination of these questions might have raised some interesting points. For example, it is quite possible for negotiated wage-rates to be cost-determined while earnings behave as though they were entirely demand-determined.

The second half of the book is devoted to particular aspects of inflation: price control, hyper-inflation and the flight from cash, interest rates, liquidity, foreign trade. The chapter on interest rates contains one point which is not as clear as it should be, namely why their correlation with the rate of price change has rarely been what Fisher contended it would be. The chapter on liquidity is rather dull because none of the likely effects of changes in liquidity can be traced in practice, but this is hardly Professor Brown's fault. The chapter on the international aspects of inflation is pretty tough going; evidently Professor Brown had got fed up with laymen by this time, for one meets a Pearsonian co-efficient and some elasticities of substitution. All in all he covers the ground thoroughly and has provided us with a major work for which both he and the Royal Institute of International Affairs deserve our grateful thanks.

RALPH TURVEY.

The London Capital Market: Its Structure, Strains and Management. By NORMAN MACRAE. Staples Press. 1955. 285 pp. 25s.

This book will be a boon to undergraduates and others who are beginning their studies in banking and finance. The author, as a working financial journalist, clearly has, if not a first-hand, at least a very close second-hand knowledge of the institutions and processes he describes, and is able to bring his discussion into much closer relationship with real life than are the great majority of academic writers. He writes clearly and simply, and if at times he seems to be making his allowances for the ignorance of his readers a little too obvious, that is a fault very much on the right side.

The book is divided into two largely separate parts, the first dealing with the structure and operations of the capital market and the second with the overall control of the climate of the market by the Bank of England through its monetary policy. Mr. Macrae starts from the now fashionable basis of national income statistics, and makes a (very tentative) estimate of the size of the national productive capital and its growth, both in real and in money terms, since the end of the war. He then proceeds to examine the sources and total of national savings, and builds up estimates of the amounts of different forms of capital held by different sectors of the economy. Among other interesting conclusions that he reaches is that whereas persons resident in the United Kingdom hold less than a quarter of quoted British Government securities (the rest being held by Government departments, banks and other institutions, and overseas residents), they hold over 60 per cent. of all other quoted securities and nearly 80 per cent. of quoted British industrial securities. He makes the point that the demand for industrial securities must have received a temporary stimulus from the effects of nationalisation, which has caused former owners of securities of nationalised companies to seek alternative investments to the gilt-edged securities they were awarded as compensation; from this he draws the conclusion that it may be over-optimistic to expect the demand for industrials to be maintained indefinitely at post-war levels. In reaching this conclusion, however, he does not seem to have given full consideration to the recent remarkable rise in personal saving, or to the effect of continued inflation in making investors desirous of putting their money into something representing tangible assets.

The second part of the book deals briefly but in a most helpful way with the organisation and practice of the London banking system, especially in relationship to the resurrection of monetary policy as a means of controlling the economy. In general, Mr. Macrae comes down heavily on the side of the traditional methods of tight money and higher interest rates as opposed to direct controls as a means of checking inflation. Even those who disagree with his approach and reject his conclusions will benefit from his very lucid examination of the problems involved.

The most serious criticism which can be directed against this part of the book is that Mr. Macrae does not seem to give adequate consideration to the position of the United Kingdom as banker to the rest of the Sterling Area. References to the overseas-owned sterling balances occur mainly in Part I, where they are mostly confined to the form in which the balances are held, while in the discussion on the Exchange Equalisation Account it is not made sufficiently clear that changes in the Account's holdings of gold and foreign exchange are caused by changes in the balance of payments of the Sterling Area as a whole rather than of the United Kingdom alone. Another point at which it is possible to question Mr. Macrae's distribution of space is in Part I, where the attempt to cover insurance companies, building societies, investment trusts and pension funds in no more than six pages involves a quite excessive degree of compression. It is to be hoped that when Mr. Macrae brings out his second edition he will devote considerably more space to both these subjects and so increase still further the usefulness of his book.

F. W. PAISH.

Selected Papers in Statistics and Probability. By ABRAHAM WALD. Edited for the Institute of Mathematical Statistics, by T. W. ANDERSON and others. McGraw-Hill Book Co., New York. 1955. ix + 702 pp. 60s.

Abraham Wald was born in Rumania in 1902; educated at home and at Vienna; graduated in mathematics and worked for a while in econometrics; went to the United States in 1938; became interested in statistics and succeeded Hotelling at Columbia; and was killed in an air crash in India in 1950, just when his powers were at their height and his domestic and academic life seemed happily settled in his new country of adoption.

This volume brings together by photo-offset his 50 papers on probability and statistics published between 1938 and 1950 together with one unpublished paper. It is a very useful collection embodying the whole of Wald's work in this field except his books on Sequential Analysis and Decision Functions. The Institute of Mathematical Statistics, which sponsored the work, is to be congratulated on making it available.

It is very difficult to write objectively about Wald's work. On his death he was promptly canonized by a certain group of American statisticians and it has become almost as necessary to refer to him in current papers as it was 20 years ago to include at least a perfunctory reference to Sir Ronald Fisher. The problem of evaluation is made no easier by the fact that some of his self-appointed successors have developed a rabid anglophobia, systematically pejorating any English contributions to decision theory. Wald himself was not concerned about priorities or controversy; it would be a pity if his memory were to suffer from the zeal of his disciples.

Wald was primarily a mathematician and his mature work was expressed so abstractly that only a trained mathematician can follow it in detail. He had a genius for generalization and a true mathematician's passion for rigour. This makes his work (except for the book on Sequential Analysis) unreadable except for the expert, which is unfortunate because it is powerful and stimulating. However, there is plenty of exegesis now available and his work has undoubtedly had a great influence on his contemporaries even in non-mathematical fields.

The theory of decision functions, which is his main claim to distinction, is the culminating point of a long line of development in the use of probability theory as a guide to conduct. The early statisticians made their inferences and drew their conclusions from samples on an intuitive basis. Their procedures were first put on a logically satisfying basis by Neyman and Pearson, beginning about 1928. It was Neyman himself in 1939 who drew a distinction between inductive inference, which deals with belief, and inductive behaviour, which determines action. Neyman, so far as I know, did not go so far as to suggest that statistical problems were all of the second kind. The idea took root very readily, however, in the United States and it is perhaps not accidental that it should have flourished mainly in a country where deeds speak louder than words and actions and decisions are valued more highly than beliefs and suspended judgments. Wald generalised and extended the theory decisions based on statistical variation and may be said to have established a new branch of statistics. Even he did not, so far as I am aware, suggest that decision functions covered everything. But such a claim has been advanced recently by Dr. L. J. Savage, whose book, purporting to discuss the Fundamental Ideas of Statistics, is confined entirely to decision function theory.

This phase will pass and statistical logicians will realise, as some of them have already realised, that statistics cannot be reduced to the simplicity of forced decisions. The contemplative element in scientific thought must ultimately reassert itself. But much of decision theory will endure and Wald, by developing it, has earned a permanent place among the masters of theoretical statistics.

M. G. KENDALL.

The Theory of Collective Bargaining. By W. H HUTT. With a Preface by Ludwig von Mises. The Free Press, Glencoe, Illinois. 1954. 150 pp. $3.

There will be a warm welcome for this reprinting of a celebrated essay. How does it appear after 25 years ? Of its quality there can be no doubt—its learning, lucidity and point. It is an invaluable guide to one line in the literature; and a great sweeper-away of cobwebs. But do its main contentions stand ?

It set out to deal with the arguments which purport to show that in the absence of combination the wage earner is at a disadvantage in bargaining, or that combination may raise his earnings otherwise than in the usual way of monopoly; and it found all these arguments insubstantial.

The first of them, in Adam Smith's words, was that though in the long run the workman might be " as necessary to his master as his master is to him ", the necessity is " not so immediate ". Professor Hutt did not so much deal with this directly, as expose the over-generality of some statements of it; but his main ground for rejecting it probably appeared when he dealt with a second argument, in which the workman's lack of reserve is said to lead to indeterminacy of the wage bargain, because the marginal utility of income to him varies with the wage he happens to be able to get initially. On this he commented, " An individual worker's need for income might be so great that he would be prepared to give 19/20th of the results of his labour to the person who would lend him a spade rather than till the soil with his hands. But the market rate might be such that he might have to give only 1/5th ". He was surely right to point out that an effective labour market does give a protection to the individual worker. In countries where decade after decade the number of jobs has been rapidly rising—a rise which could have come about only through employers looking for more workers—there can be no doubt of the general effectiveness of the competition of employers for labour. But though general, this is far from complete: any one man may still find himself faced by a single offer of employment; and then Adam Smith's point tells. Professor Hutt rightly attacked the notion that this was the invariable position of the workman; but the fact that it has existed and may always recur has burnt itself into the consciousness of labour, and is a major source of unionism. Marshall summed it up, in *The Economics of Industry*, when he said: " Where there is little competition, price is indeterminate; and then those are at a disadvantage who are known to be bound to sell without reserve ".

The third main argument with which Professor Hutt dealt also concerned indeterminacy; it was that when a union meets an employers' association there is bilateral monopoly, and the result depends on bargaining power rather than market forces. His main comment was that if the bargain has left either side with less than its supply price, it will divert its resources elsewhere. This has much force in application to the bargaining in any one industry, but leaves open the possibility that a general push by one side throughout a substantial part of the economy might squeeze the other, whose supply to all uses might be much less elastic than to any one use. A variant of this perhaps appeared in Great Britain in the sharp deflation of 1921–22, when selling prices were driven down against a wage level defended by a strong trade unionism: profit margins seem to have been squeezed, and never to have returned to their pre-war norms.

We may also ask whether the quarter century which has now gone by has added any new possibilities to the argument. There seem to be three. There is the case of monopsony in the labour market—a possibility set out clearly enough by Marshall in *The Economics of Industry*, but only more recently set up in business under its own name. There is oligopoly, with the kinked demand curve and vertical segment of the marginal revenue curve: though the indeterminacy of wages within this range holds only if the sellers remain reluctant to change their prices even in response to a common rise of costs. The third possibility has already been mentioned: that in certain circumstances the bargaining power of trade unions as a whole, exerted along a wide front, may take effect in shifts in the relative remuneration of broad categories of factors.

E. H. PHELPS BROWN.

The Irish Pound, 1797–1826. A Reprint of the Report of the Committee of 1804 . . . on the . . . Irish currency, with selections from the Minutes of Evidence . . . and an introduction by FRANK WHITSON FETTER. George Allen & Unwin Ltd. 1955. 136 pp. 16s.

By this reprint, Professor Fetter has placed us greatly in his debt. His long Introduction, which is a model of well digested research, shows that while the Bank of Ireland was not under the same pressure for specie in 1797 as was the Bank of England, its continued ability to pay in cash depended on access to London's reserves. Consequently, while the enforcement of the restriction in Ireland appears to have been regarded there as a political measure, it was in fact unavoidable. But the outcome was that the Bank of Ireland's note-issues rose rapidly, and the Dublin/London exchange rate deteriorated; although since the North of Ireland used gold, and not banknotes, the Belfast/London rate was rising.

In 1804 a Parliamentary Committee was set up to examine this anomaly. The problem as they saw it is analysed by Professor Fetter into four issues: the causes of exchange fluctuations; the degree of control over Irish private banks exercised by the Bank of Ireland; the feasibility of discounting all good paper offered; and the correct policy to stabilise the Irish exchange. In the discussion of these problems enough excerpts from the Evidence are given to point the contrast between the acuity of many of the questions asked and the muddle-headedness of many of the answers given. There follow brief but succinct accounts of the Report itself, of the lack of interest which Parliament showed in it, and of the scanty references to Irish problems in the Reports of the Bullion Committee and of the Committees of 1819 and 1826. In his summing-up, Professor Fetter drives home the point that what was being discussed in 1804 was an early form of the sterling exchange standard.

The student will turn from this Introduction to the Report and Evidence with a greatly heightened understanding of what they are all about. It is perhaps slightly unfortunate that the 20 pages of selections from the Minutes of Evidence contain only a few of the plums embedded in the Introduction. This has the effect of making the witnesses from the Bank of Ireland sound more intelligent than they were; and of concealing the fact that the Bank of England witnesses were no better. Certainly, if read all together, the various extracts do give a fairly comprehensive survey of the viewpoints expressed; but the absence of an index necessitates the reader quarrying for some of the most significant himself.

There is room to discuss only one of Professor Fetter's thought-provoking suggestions—his explanation of the curious contrast between the interest shown by Parliament in the appointment of the Committee in 1804, and its complete disregard of their Report and of Irish currency problems thereafter. The author attributes this to the accident that the debate preceding the appointment revealed a scandal—certain officials whose salaries were expressed in Irish pounds were found to be receiving payment in sterling at par instead of at the depreciated exchange rate. This argument is supported by some telling quotations from unpublished correspondence. Yet one has the feeling that the significance of the revelation may be overestimated. It is, after all, a well established British habit to bury an inconvenient problem by referring it to a committee; and the *Annual Register* and *Gentleman's Magazine*, reporting the debate, scarcely suggest that the scandal was regarded as more than a convenient stick with which to beat the Government. Nevertheless, Professor Fetter may be right; and he is certainly justified in reminding us that political discussions of technical economic issues are apt to be less abstract than economists would wish.

A useful bibliography and lists of members of, and witnesses before, the Committee, complete an invaluable companion volume to *The Paper Pound.*

J. K. HORSEFIELD.

The Economics of Recession and Revival: An Interpretation of 1937-38. By KENNETH D. ROOSE. Yale University Press, New Haven. 1954. xi + 280 pp. $4.

The author takes his start from the explanations of the American recession and recovery of 1937–38 that have been put forward in the past, and he includes throughout his text extensive quotations and summaries of the views of previous writers. In attempting to establish or disprove causal connections he places the chief emphasis on relative timing. Econometric techniques are not used for analysing the great amount of statistical material presented.

The main weakness of the book is perhaps that the theories which the author sets out to test are mostly propounded in rather crude terms—under-consumption, secular stagnation and so on—so that the tests offered are inconclusive as applied to subtler formulations. Particularly unsatisfactory in this respect is the treatment of inventories. Here Professor Roose is primarily concerned to answer the question whether the level of inventories was excessive at the beginning of the recession. But if the purpose is to explain a decline of (planned) inventory *investment* from a peak, what is relevant is evidently not whether business men considered inventories too high absolutely, but whether they considered them too low by a smaller margin than before.

Professor Roose's most interesting and original contributions are those relating to government spending and Federal Reserve policy. He establishes a fair case for doubting the validity of the commonly accepted view that it was the decline in the government's contribution to effective demand that initiated the recession, since this contribution reached its peak in June 1936 and total incomes did not begin to decline until over a year later. On the other hand, Professor Roose is able to show a plausible connection between the origins of the rise in long-term interest rates that took place from the beginning of 1937 and the increase in banks' reserve requirements imposed by the Federal Reserve Board in August 1936. He considers that this rise in interest rates, together with the reduction in corporations' reserves, brought about by the undistributed profits tax, bore a large part of the responsibility for the decline in investment in 1937. The other chief cause he finds in the rise in wages and other costs.

R. C. O. MATTHEWS.

National Income and Social Accounting. By HAROLD C. EDEY and ALAN T. PEACOCK. Hutchinson's University Library 1954. 224 pp. 8s. 6d.

Part I of this book is called " The Framework of Social Accounting " and deals successively with the nature of national income and social accounting, inter-country transactions, Government accounts and problems of classification and definition. It finishes with a comparative tabulation of the actual accounts of the U.K. and the U.S. Part II describes some of the main applications of social accounting—the measurement of changes in the real product, fiscal policy applications and input-output tables. Part III is devoted to " Further Analysis ", meaning thereby a discussion of concepts and a chapter on " Asset structure Analysis ".

The intentions behind this book are obviously good. There is undoubtedly a gap in British literature (and perhaps even in American) which a treatment of this kind can do a good deal to fill. Until now there has been virtually nothing between the simplified exposition of Professor Hicks in *The Social Framework* and the introductory pamphlet by Professors Meade and Stone on the one hand and the learned journals and official publications at the other extreme. A further merit is that this book is not confined to social accounting in the narrower sense but also branches out into input-output analysis and similar cognate subjects. Therefore to produce something covering a fairly wide field at an intermediate level was obviously a good idea.

How does the *ex-post* realisation compare with the *ex-ante* plan? The exposition undoubtedly has a great deal of merit. The emphasis that accounts, matrices and the usual Keynesian equations are not dwellers in different planets but simply different manifestations of the same underlying relationships is all to the good. The clarity of the exposition of the chapters on real product and input-output will leave many students much less bewildered than before. And no one can possibly complain about the modernity of the treatment.

Despite these solid achievements, it must be said quite bluntly that the book is not quite as successful as it should have been. The first main defect lies in the arrangement of the material. The authors themselves have to warn (p. viii) the non-experts to read Part III before reading Part II. It is also rather paradoxical that Chapter IX, the first chapter in Part III, should be labelled " The conceptual basis of national income accounts ". But it is not only the arrangement between the various Parts which is questionable but also that within the Parts and even within chapters. Surely it would have been more logical to take the material of Chapter IV (" Problems of classification and definition ") much earlier? And is it not a little odd to discuss the accounting properties of overseas transactions (e.g., p. 37) and the appropriate matrix (p. 43) *before* we reach the precise definition of overseas transactions on pp. 44–45?

The second main defect lies in the varying degrees of difficulty of content and exposition. Although Part III (" Asset Structure ") is the most original part of the book one wonders whether a text book is really the right place for such a discussion. The territory covered is wide enough without bringing in fields where the unanimity of expert opinion is far less marked.

But despite these blemishes the book does meet a definite need and it is very much to be hoped that the authors will have the opportunity to improve their presentation in a second edition.

A. R. PREST.

The Compleat Strategyst. By J. D. WILLIAMS. McGraw-Hill Book Co., New York. 1954. ix + 234 pp. 38s.

This is a light-hearted exposition of the Theory of Games. The author seems to have enjoyed writing it and the reviewer found more pleasure reading it than is normal for books reviewed in these pages. This in itself would be no proof of its excellence. It was inevitable that a book popularising the theory of games would be written and one could only hope that it would make some of the elementary principles accessible to the non-technical reader without sacrificing too much of its scientific content. In this the author has brilliantly succeeded. No mathematical equipment is required beyond familiarity with simple fractions. There are many amusing examples such as the question of the best strategies for a cat and a mouse in a blind maze, or Merlin's advice to Guinevere who wishes to pick the probable winner amongst the jousting knights. Indeed, it is the large number and wide range of examples which is most likely to convince the reader that the theory of games may have direct applications in strategic situations; that is in those situations where one has no control and no information about one's opponents action though the possibilities at his disposal are known; the opponent need not be human, but may upon occasion be identified with " nature ", and while an intuitive interpretation of " nature's " strategies is sometimes difficult it is these games that are of most practical interest to the economist.

Mr. Williams manages to poke fun at the more irritating habits of mathematicians (" . . . they *of course instantly* recognise that this is equivalent to that "). He treats the reader to disquisitions on the habits of groundhogs and the various national terms for Russian roulette; he always has a point and is never pompous. In consequence the reader realises that the theory of games which has been the plaything of mathematicians and of some economists can also be fun.

From this point of view there is not much to criticise. It would have been beyond the scope of such a book to explain how two-person games with a large number of strategies available to both players can be solved, beyond saying that this is laborious, and the author wisely refrains. Also, the difficulties of measurable, let alone transferable, utility are left alone. It is these difficulties which prevent immediate application of the theory to economic problems. Only when the analysis of games for more than two persons is completed will economists become fully convinced of its use in their field. Applications to operational research, statistical decisions and military strategies are easier and are therefore more advanced and better known.

In any case, one may be confident that some acquaintance with games theory will soon be *de rigueur* for high and middle brows; nor can economists afford to neglect it. Indeed, they must be grateful to Mr. Williams for having made it so easy to form an acquaintance with a subject that has seemed to be remote from reality and inaccessible.

G. MORTON.

The Problem of the National Debt. By EDWARD NEVIN. University of Wales Press, Cardiff. 1954. 115 pp. 6s.

The reduced importance of debt interest payments as a form of government expenditure, and the relatively minor role of debt analysis in Keynesian economics have both conspired to reduce the flow of publications on the problems of the national debt to a small trickle of articles. Significantly enough, as Mr. Nevin reminds us, the last major work on the British national debt—Hargreaves' *National Debt*—was written a quarter of a century ago, and it is really a study in economic history. Mr. Nevin has realised that the changes in our institutional structure suggest modifications in the application of economic theory to debt problems, and makes a case out for the growing importance of debt policy in the years ahead. His tersely written monograph is a most welcome contribution to the small number of works on the post-war public finances of this country.

Mr. Nevin is at his best in his theoretical exposition of the effects of various debt patterns. He follows fairly closely an approach made familiar by Musgrave and Domar, and very rightly sees the policy problem as one of reconciling the conflicting objectives which have to be translated into a rational system of public finance. He has an original contribution to make in his attempt to show how our debt transactions should be shown in a system of social accounts, and his discovery that there is a difference of over £130 mn. between gross and net payments of debt interest (after allowing for intergovernmental payments) may come as a surprise. There is some skilful work here, but it is a pity that Mr. Nevin falls into his own trap and expresses *gross* payments of debt interest as a percentage of government *revenue* (p. 32) in trying to explain the importance of the interest payments in government transactions.

The extent to which any drastic modifications in debt structure are required obviously depends on the extent to which debt obligations become a serious embarrassment to the conduct of government economic policy as a whole. Mr. Nevin only answers this point indirectly by reminding us that nearly 50 per cent. of the national debt will have to be repaid or replaced over the next ten years. This indirect evidence does not convince the reviewer. In consequence, Mr. Nevin's rather drastic remedies for streamlining the debt so that different institutions, such as banks and insurance companies, should be issued with special non-transferable bond issues, would seem to be unnecessary, quite apart from their practicability. But there is no doubt that Mr. Nevin argues his case very well.

ALAN T. PEACOCK.

Prosperity and Parenthood. A Study of Family Planning among the Victorian Middle Classes. By J. A. BANKS. Routledge and Kegan Paul Ltd. 1954. vi + 240 pp. £1 1s.

It is well known that the birth rate in Great Britain fell during the second half of the nineteenth century and that the middle classes in particular had fewer children. It is also accepted that this decline was caused by the deliberate restriction of family size and not by biological factors. One of the explanations generally given is that the increased pressure of the standard of living on the middle classes led them to desire smaller families, and that the increasing secularisation of life made the idea of birth control socially more acceptable, so that means were provided by which the desire for family limitation could be carried into effect.

Although these generalisations appear plausible *a priori* they have not hitherto been adequately documented, and in this book Mr. Banks has attempted to fill the gap. His task is not easy, for the middle classes tended to escape the attention of nineteenth century social investigators, and he therefore has to rely on indirect evidence. Such evidence he finds in books on etiquette, manuals on household management, pamphlets on marriage, publications dealing with careers for middle-class children, boarding school prospectuses and, last but not least, the novels of the period, particularly those of Anthony Trollope. From these sources he has built up a picture of the conventional middle-class standard of life, as shown in these publications. It is, of course, impossible to be certain to what extent these accounts correspond with reality, but it is likely that changes found in different editions of the same manual or in manuals published at different times will reflect some real movement.

Mr. Banks concludes that in the twenty years following 1850 it was the scale of middle-class life and the pattern of expenditure that were changing rather than the cost of living.

> " Although prices rose by only 5 per cent. the expansion in standards required an additional outlay of 50 per cent., if status was not to be lost. Assuming that these domestic items took up somewhere between 40 and 55 per cent. of income it is clear that a family whose receipts increased by less than 20 per cent. over the period, all other things remaining unchanged, would have been pressed to live up to the new levels forced upon it ".

In fact a new standard of living appropriate to the middle classes was evolving, a standard the maintenance of which was made possible by the rising incomes of the period. Although food prices rose little, some other items entering into the middle-class expenditure increased in price: the wages of domestic servants, for instance, increased, as did the cost of what was regarded as an acceptable education.

The maintenance of this new standard of life was threatened by the Great Depression of the 'seventies. Mr. Banks suggests that the threat was less a real than a psychological one, existing in the minds of the middle classes. Real incomes did not fall, but their rate of expansion slowed down, and among the reactions to this change was family limitation. But the spread of birth control at that particular point cannot be entirely explained in terms of changing standards of life and Mr. Banks does not pretend to do so. He is indeed doubtful whether it is possible to regard it even as a major explanatory factor. In his conclusion he points out the difficulties involved in the analysis of a problem of this kind and modestly claims to have contributed more detailed and precise evidence on one aspect of it. In this claim he must be judged to have been eminently successful.

E. GREBENIK.

An Introduction to Statistical Calculations. By J. MOUNSEY. English Universities Press. 1953. xi + 351 pp. 15s.

A book of statistical exercises has been required for a long time and this one fulfills the requirements in the field of elementary statistical methods excellently, giving examples of questions, and of types of questions, which have been set in examination papers over the past 20 years or so. Use is made of London University B.Sc. Econ. and B.Com. questions, together with those of the Royal Statistical Society, of the Society of Incorporated Accountants and Auditors and of the Institute of Transport; whilst the questions would be suitable for many preparing for various technical and commercial examinations and for those including statistics as part of their mathematics syllabus for the general certificate of education.

The method of presentation is to divide the exercises into chapters on such subjects as measures of location, weighted averages, time series and index numbers, on errors due to rounding, on dispersion, curve fitting, correlation and moments, on the binomial, poisson and normal distributions and on tests of significance. Each chapter summarises the statistical methods in note form, works out some typical examples completely, with excellent and full comments on points which have seemed of significance to the author, and concludes with a series of exercises, the numerical answers to which are given at the end of the book.

The book is of " pocket size ", 7½ in. by 5 in. and less than 1 in. thick despite its 350 pages, and hence it is convenient for study in spare half-hours, but the narrow margins and rather small print give the pages a forbidding appearance until one becomes accustomed to them. The printing and paper, however, are good and the quantity of material in the book, especially when related to its price, is enormous. This indeed makes one wonder if the book ought to be commended to the lone student who has no teacher to guide him. Such a student is likely to have other subjects to work at and to be discouraged at the apparent extent of this subject. Here for instance are some 600 exercises; at half-an-hour each they imply six hours a week for a year, apart from the time required to study the text and worked examples. The student would have to try to discriminate, and yet a student who uses this book is not likely to be in a good position to do so. If wise, he will compare his syllabus carefully with the text of the book and decide which chapters he can afford to ignore; even then he will need to select a sample of exercises to work through, and yet rather curiously the book gives little information on how a random selection should be made, presumably because examiners do not usually set questions which involve calculations on choosing samples. The danger of so many exercises is that students will look through them and think they can calculate correctly the results required without trying to do so and without, in fact, being able to do so, and if able to do the calculations, it is very likely that they will not be able to do them neatly without practice.

The text is written in a completely impersonal way, indicating what were the questions set and the mechanical answers thereto, without evidence of the author's own preference for methods or forms of approach to the subject. In consequence, the book is not likely to attract a newcomer to the subject. A more discursive book would be preferable, even for those whose objective is simply to pass an examination. Thus, one feels that the student working on his own should have a book which tries to show what is being attempted in statistics and should use parts of this book on exercises involving figures for revision. However, if there is personal contact with a teacher, such as in a grammar or evening school, who is willing to interest the students in the subject the book could make an excellent first text.

It is perhaps both an advantage and defect that the primary purpose of the book is to help students to pass examinations and that its comprehensiveness is such that the author can claim that " most of the traps which beset the newcomer in this subject have been exposed ". This is, of course, provided the newcomer works right through the book. The traps can be inherent in the subject as well as set by the examiners; and surely most examiners would prefer students to avoid the traps because they considered what the figures they were working with and the manipulations they performed implied rather than because they had learnt the traps by being told of each one mechanically.

This is a book that all teachers of statistical methods, and many students will find very useful.

H. S. BOOKER.

A Concise Economic History of Britain from 1750 to Recent Times. By W. H. B. COURT. Cambridge University Press. 1954. viii + 368 pp. 21s.

Professor Court's sequel to Clapham's *Concise Economic History of Britain from the Earliest Times to A.D. 1750*, eagerly expected, proves to have been well worth waiting for. There was need for a book to embody much recent research available hitherto only in articles. Discussion of economic history mostly runs in subject grooves, convenient for teaching, but dangerous to the understanding of the whole. For a masterly illustration of the interplay of various aspects of economic life, Court's first four chapters are a joy to read.

Every writer in this field has to delimit his three dimensions, that of geography, that of period and that of subject. Following Clapham, Court mentions Britain in his title, but his book discusses England, with occasional excursions into other parts of the British Isles. Within England, an excellent balance is maintained, because the author's intimate knowledge of economic life in the Midlands precludes the temptation to tell his story in terms of Lancashire and Yorkshire or London and the South. The period is broken at Queen Victoria's accession, an event in political history; would not the Great Exhibition have furnished a more appropriate dividing line ? Economic history is generously interpreted and includes much social and administrative history. The book avoids excessive description of technical details; on the other hand, this reviewer considered the treatment of trade unions too cursory for a full understanding.

Compression of treatment altogether implies risks of misunderstanding of phrases such as " the Speenhamland system had been regularised in law ", or " the repeal of the Usury Act in 1833 ". The State in 1911 established its own unemployment insurance scheme partially in support, not instead, of those already maintained by trade unions. Lord Morpeth himself was the First Commissioner of Woods and Forests who presided over the General Board of Health of 1848. By an unfortunate slip, the proportion of total British meat consumption drawn from home production in the late 1860s appears as one-seventh (p. 163), instead of six-sevenths—a slip corrected only 40 pages later.

Court admits that we are still too close to the inter-war years for the detachment required for historical study; hence treatment of this period consists of discussion of a number of outstanding trends and problems. This book, with its picturesque maritime similes, is invaluable to the teacher of modern English economic history anxious to recommend to his students an account of the subject well informed by the latest research.

WALTER M. STERN.

A Merseyside Town in the Industrial Revolution : *St. Helens, 1750-1900.* By T. C. BARKER and J. R. HARRIS. Liverpool University Press. 1954. xviii + 508 pp. 30s.

Writers on local history may achieve honour even in their own country and house, but require great versatility. To do justice to this industrial town, Messrs. Barker and Harris have to display intimate knowledge of the glass, salt, coal, copper and alkali industries, not to mention others of lesser importance to St. Helens. Having elsewhere subjected at least one of these industries each to specialised study, the authors rise nobly to their task. The reviewer can only admire the thoroughness with which the abundant industrial and municipal records as well as local newspapers have been combed to write what is often the story of industrial Merseyside rather than merely of St. Helens. Much of the eighteenth century account would serve economists as a model sermon on the influence of transport on industrial development in an area where the Sankey Canal preceded even the famous Bridgewater Canal. Yet St. Helens did not become a boom town until the railway age ; its comparatively late flowering explains the buoyant and cheerful mid-nineteenth century atmosphere, contrasting with the gloomy picture painted by others of Lancashire towns at that time. From some valuable chapters on social history, we learn how the union managed its workhouse ; that the town's main sewer was not covered in till 1895 ; how some people worked 112 hours every other week in the 1880s, while all existed in a general stench of hydrochloric acid and rotten eggs (sulphuretted hydrogen). Yet the pauper population remained low, and the general standard of living improved, partly through the growth of self-help agencies (trade unions and co-operative societies), partly owing to industrial leaders with a social conscience, men as active in the welfare of the town as in consolidating their business position ; the chief brewer purveyed not only beer, but also secured better supplies of a somewhat competitive liquid, water, for his fellow townsmen. An interesting sidelight on market control : as early as 1800, brewers possessed tied houses.

Walter M. Stern.

The Economic Development of Ceylon. xxxii + 829 pp. $7.50. 60s.

The Economic Development of Nicaragua. xxxi + 424 pp. $5. 40s.
(Reports of Missions organized by the International Bank for Reconstruction and Development.) Johns Hopkins Press. Geoffrey Cumberlege. 1953.

Both these books are reports of World Bank Missions at the request of the Governments of the respective countries. The despatch of such teams to a number of countries has now become a recognised activity of the Bank and there can be little doubt that such investigations serve a most useful purpose in providing the Bank with first-hand information as well as a digest of material from official sources. In return, the Government receives the benefit of outside and disinterested advice on how best to resolve some of its problems and on ways and means of framing its development plans. Such invitations also prepare the ground for later applications to the Bank for possible financial assistance. The purpose of publication is to ensure that these reports are widely read and discussed. This is a most laudable objective, but it is not likely to be achieved at current book prices. It is true that these reports are well produced, that the survey of the economies concerned is thorough and reasonably detailed (though much of it tends to read rather like a Year Book), that the recommendations and the reasons for them present a critical point of view which adds considerably to the value of what might otherwise be little more than a factual compendium, and, finally, that all in all the customer gets value for money. Yet these reports cannot be for the many as the Bank apparently intends—they are much too expensive to buy—and in these circumstances they will tend merely to become reference books on library shelves. If the Bank really wants to secure widespread notice of the character of the problems which face these countries, it must provide the public with cheap editions, not necessarily abridged, but certainly with less emphasis on first-class production. Indeed, it is almost indecent to present a report on an " under-developed " country with so much plush.

J. S. G. Wilson.

Stock Market Economics. By M. S. Rix. Sir Isaac Pitman & Sons Ltd. 1954. xi+284 pp. 25s.

The literature on the economic aspects of the British financial system has up to now lacked any considerable work on the economic aspects of the stock market. This book (which is intended as a self-contained account for students) is therefore a welcome addition, particularly as it is written by someone who has been in such close contact with the stock market for many years. It deals with the general functions of the Stock Exchange as a market for old and new securities, the roles of brokers and jobbers, the characteristics of types of securities, company law and organisation, investment calculations, taxation, bonus issues, the motives and strategies of private and institutional investors and with the determination of security prices.

The best parts are those in which the author deals with factual matters. Here there is much sound exposition and illuminating comment, although by no means all of the author's views are orthodox. An instance of a judgment which should cause the reader to think is the statement that the " speculator's removal of price anomalies appeals to tidy minds, and beyond that has only minor usefulness " (p. 211). There is also an interesting account of various investment systems—the Vassar plan (and variants), the Dow Theory and the Hatch System—which provide rules of thumb of varying generality for investors (pp. 188–91). One thing which might have been included is a collection of market maxims (" sell on good news ") with comments, and there are a number of small matters which are open to criticism; for example, the restriction of the term marketability to mean marketability on the stock market (p. 7), and a tendency to talk of what is good for the stock market as if it was an independent entity, when meaning what is convenient or pleasant for brokers, jobbers or certain classes of investors (pp. 212, 270). In the latter place this leads to strangely conservative judgment against take-over bids.

The weakness of the book is on the theoretical side. First, there are one or two attempts to bring theory in explicitly, and these seem to add little to the sections in which they occur and are sometimes peculiar in themselves. For example:

> " The use of ploughed-back profits, to the extent that they are invested in the economic sense and not merely retained in liquid form, is an automatic device for securing equality in any one business between Keynesian savings and investment " (p. 38).

Second, the discussion of the determination of security prices in the last four chapters is not very satisfactory, the chief reason being that a sound comparative static view of the determination of security prices is lacking. Comparative statics is of course limited in usefulness, but, providing that stability and time path considerations are not allowed to drop out of sight, it does enforce a logical consistency without which any sort of description rapidly becomes haphazard; also the human mind can often reason through comparative statics to some fairly reliable conclusions which may be expected to hold in a dynamic world. But here the author jumps straight into some very loose dynamics :

> " This process [of switching into securities from other assets or by reducing consumption] could continue until stocks and shares appeared to be overvalued or other assets undervalued, and the transfer of funds ceased " (p. 246).

> " . . . if cash balances have been run up through a genuine increase in savings . . . and not because of any particular feeling of insecurity, low prices will attract the investor. An increased level of cash means therefore that borrowers must offer either a good risk or a very low price to bring money into the market " (p. 241).

It is also suggested that a transfer of funds to the stock market is useful in inflation, as it diverts pressure from goods to securities where borrowers get some benefit by being able to raise money more cheaply (p. 246).

It is to be hoped that in the second edition some of the rough patches will be removed, for this book deals with an important field and the treatment of the factual aspects of the stock market is of a high standard.

R. F. G. Alford.

Fairer Shares. By John Spedan Lewis. Staples Press. 1954. ix + 244 pp. 8s. 6d.

This book by the founder of the John Lewis Partnership follows an earlier volume (*Partnership For All*, 1948) on this well known experiment in producer co-operation by the same author. The present work is a further exploration of the implications and problems of this form of co-partnership coupled with a plea for its extension to other fields of business activity. Part I outlines the basic principles and Part II compares producer co-operation with private enterprise, public enterprise and consumers' co-operation. Parts III and IV comment on the appropriate division of powers between the various organs of higher management and on various aspects of managerial policy. One disappointing feature of the book is the slimness of Part II (thirteen pages). A more thorough analysis might have been expected from someone so concerned to demonstrate the superiority of co-partnership.

The most powerful argument for some form of co-partnership is that those who contribute their labour to the enterprise should share in its control. It is not always easy to defend the normal practice in a capitalist society of vesting control entirely in those who supply the risk capital. The contemporary increase in joint consultation is evidence of this but consultation falls short of what many people regard as a proper concession to labour's claim. It is surprising, therefore, that Mr. Lewis should put the main stress on the redistributive effects of producer co-operation and should so badly overstate his case by referring to our present society as one of " millionaires and slums ". He has made little effort to meet the inevitable criticism that wages and salaries are best determined by market forces and that any desirable redistribution of incomes is best effected by the State through taxation and the social services. It could have been met fairly effectively.

Mr. Lewis is no unpractical idealist. He appears to have few illusions about the unpromising human material with which many partnerships will have to be built. The need for firm executive authority is always stressed and he has no illusions about the realities of business life. But in presenting his ideas as " perhaps the only alternative to Communism " he appears to take a very superficial view of the attractions of communistic ideology. One suspects that most persons likely to be attracted to Communism would have very little use for Mr. Lewis.

The book leaves the present writer in much doubt about the possibilities of further successful experimentation with producer co-operation on any great scale—particularly where investment is more risky and trade unions more militant than with the John Lewis Partnership. It seems that the success of the latter has had most to do with the generosity and personality of its founder. The discussion of constitutional forms and division of powers shows great wisdom and ingenuity but much is inevitably dependent upon the spirit with which they are operated and the temper of the people affected.

Fairer Shares is not always easy to read. There is some tiresome repetition, the style is very discursive, and the meaning is often obscure. But one cannot fail to be impressed by the sincerity of the author and many will be indebted to him for this further exposition of his ideas.

A. BEACHAM.

Soviet National Income and Product in 1928. By OLEG HOEFFDING. Columbia University Press. 1954. 156 pp. $3.75.

Soviet National Income and Product, 1940-48. By ABRAM BERGSON and HANS HEYMANN, Jnr. Columbia University Press. 1954. xii + 249 pp. $5.

Since the early thirties the Soviets have not divulged their national income figures in terms of current prices. The summary official statistics based on the highly processed " stable 1926–7 " price system which have since usurped the place of the missing series are apt to produce more heat than light, and most Western analysts have rightly chosen to steer clear of them as much as possible. They have therefore had to face the task of reconstructing the Soviet national accounts *ab initio*, using such stray pieces of information as may emerge from the toothcombing of a vast motley of text books, pamphlets, and trade journals. This accomplished, however, they have had to face a second, conceptually more difficult task: the revaluation of results in terms of a price system more readily understood and assimilable to Western prototypes than the Government-decreed prices of the Soviet Union. While the past decade has seen much ingenuity expended on the problem of reconstructing the accounts, and on sporadic break-throughs to the second problem, it was Professor Bergson's pioneer work of 1950 which established the pattern of approaching the two tasks in an orderly sequence and of treating the problem of revaluation in a third dimension of theoretical depth.

The two books under review are direct descendants of Bergson's original work on 1937. Their choice of years for analysis is a fortunate one: Mr. Hoeffding's book deals with the threshold of the era of Five Year Plans (1928), and the Bergson-Heymann study with its pre-war consummation (1940) and post-war resurgence (1948). We are thus provided with a survey encompassing the whole course of a vital experiment.

In all cases the tabulations of national product by use follow a standardised pattern inviting direct comparison between different years. One is not surprised to learn that the share of the gross national product devoted to individual consumption has declined from two-thirds to approximately one half in twenty years of centralised planning, though some of this has been made good by an expansion of *collective* consumer services from 5 to 10 per cent. of the national income. Somewhat less expected is the sluggishness of the gross investment ratio which gives the appearance of a slight decline (in terms of current prices), although a recalculation in terms of " factor costs " suggests a slight expansion from 23.2 per cent. to just over a quarter.

This relatively slow pace was largely due to the spectacular increase in defence outlays which appear to have grown four to five times as fast as the national income. In Mr. Hoeffding's book we are in addition presented with a useful tabulation of national income by origin, forming an interesting counterpart to a similar analysis in Bergson's work on 1937. I am sorry that no such tabulation is included in the Bergson-Heymann study under review. On the other hand, the study contains much that is new and interesting on the incidence of taxation and subsidies, the sources of Soviet finance, and an evocative comparison of resource allocation in the Soviet Union and the United States.

While the two studies may thus claim to extend our knowledge considerably in the dimensions of time and space, they have little to say on the theory of " adjusted factor costs " on which their crucial calculations are based. Instead, the reader is continually referred to Bergson's book on 1937 which should therefore be treated as an indispensable companion volume. In spite of a number of misgivings which Bergson's " factor cost standard " may evoke, there can be little doubt that it modifies the current ruble figures and percentages in the right direction. Soviet price policy being what it is, the latter will tend to overstate the share of consumption in the national income at the expense of other use-categories, particularly defence and investment, while at the same time minimising the relative contribution of the agricultural sector. Most certainly, this needs correction; but can we be quite sure that the order of magnitude of the suggested adjustments is not in many instances swamped by the error margins of the original estimates? If that were so, the " factor cost standard ", for all the labour and ingenuity invested in it, would be little more than an idle *jeu d'esprit*. I am inclined to believe that these fears are exaggerated, but I wish the authors had seen fit to devote some of their well-nigh inexhaustible energies to dispelling them.

Whatever the reliability of the final results, the two works under review, taken in conjunction with Bergson's earlier study on 1937, are among the most serious and valuable contributions to Western knowledge on the Soviet economy. F. SETON.

Uncertainty and Business Decisions. A Symposium by W. B. GALLIE, D. J. O'CONNOR, I. J. GOOD, G. P. MEREDITH, C. F. CARTER, B. R. WILLIAMS and A. D. ROY. Edited by C. F. CARTER, G. P. MEREDITH and G. L. S. SHACKLE. Liverpool University Press. 1954. viii + 101 pp. 10s. 6d.

This book offers the seven papers delivered on September 8th and 9th, 1954, at the meeting of the British Association at Liverpool. Also a summing up by Professor Meredith reprinted from *Nature*, a condensed account by Professor Shackle of his *Expectations in Economics*, a note on a practical study of business decision-making by Mr. W. R. Dunlop, and finally a personal reflection by Professor Shackle. It is described by the editors, Professors Carter, Meredith and Shackle, as a symposium on " The logic, philosophy and psychology of business decision-making under uncertainty ".

The first two papers should be of interest to philosophers concerned with the relations between the formal notions of probability theory, and the ordinary uses of words like " probable " and " likely ". Dr. Good's paper is mainly concerned with the tools of mathematical probability theory, and Professor Meredith has something to say to the psychologist about the significance of the Shackle analysis. But all the contributors discuss the economic aspect of the question, and there is no part of the book which the economist will find wholly irrelevant.

The contributors generally agree with Professor Shackle that, as Professor Meredith puts it, " There is a kind of decision to be made in connection with an outcome that is still uncertain . . . which has a *rationale* of its own, totally different in nature from the procedure whereby a frequency ratio is established between different envisaged possible outcomes ".

It is also agreed that to assimilate a decision of this kind to a judgment based on an estimate of frequency ratios is to misdescribe it in a seriously misleading way, and that the essential concepts for correctly describing such decisions are those of potential surprise and of the outcomes upon which the individual focuses his attention.

Inevitably, in a symposium of this kind, there is a certain amount of unclarity of aim: economists are said to have a special need for a theory of uncertainty; but exactly what sort of job does the economist want such a theory to do? It is suggested in the Editors' Foreword that economic dynamics needs an uncertainty theory if it is to avoid becoming " completely mechanical ". For this a " theory " need perhaps only be a formalised account of " deciding ", where outcomes are unknown. But it sometimes appears to be intended that the theory should offer the business man criteria for judging the soundness of decisions. Now surely Professor Shackle's theory can only offer formal criteria for making *subjectively* right decisions, i.e. concentrate on the outcomes which seem most likely to you. And what would count as failing to take the decision you believe most justified? This is the old issue over the logic of " maximising " in a new guise. The psychologist, Professor Meredith, seems to think that it makes sense to speak of carrying out tests to see if people behave as the theory says they do. But is it the sort of theory which any behaviour on the part of Professor Meredith's tom-cat could empirically falsify?

These puzzles do not take from the interest of the book.

V. C. WALSH.

Theory of Games and Statistical Decisions. By DAVID BLACKWELL and M.A. GIRSHICK. John Wiley & Sons, New York; Chapman & Hall. 1954. xi + 355 pp. 60s.

This excellent book is unfortunately too mathematical to be available to the average economist without the considerable amount of specialised training that would be necessary to read it. It addresses itself primarily to mathematical statisticians; however, there are some features which merit the attention of the economist.

The title is somewhat misleading to those who know little about Game Theory. Perhaps a more accurate name would have been, " Statistical Decisions and Games against Nature ". Only the two-person zero-sum game results of the Theory of Games are used.

The first two chapters give a compact mathematical exposition of two-person zero-sum games complete with a section on how to solve such games and several examples fully worked out. A two-person zero-sum game, as treated by von Neumann and Morgenstern, is a situation in which each player must act, given the information that he is opposed by an intelligent individual whose aims are diametrically opposite to his own. The now famous Minimax principle has been offered as a solution for this type of game.

The third and fourth chapters describe what a statistical game is, develop the von Neumann-Morgenstern utility measure, and discuss the principles of choice conventions in games against Nature. These are the critical chapters for the economist, dealing with action under conditions of uncertainty. The statistical game or game against Nature does not give the statistician the information that his opponent is intelligent and is trying to minimise the statistician's gain. For example, his opponent may be the weather, and even though it may appear to be so, it is doubtful that there will be rain tomorrow because the weather knows that the statistician is going on a picnic. How is the statistician to act in such a situation? Three different conventions are discussed. They are: the principles of Minimax, the Minimising of Regret, and the use of a Bayes principle. The latter principle amounts to ascribing a probability distribution to the actions of Nature. Chapter IV examines the merits and drawbacks to these conventions. The game that the statistician plays in is one in which he does not know the motivation of his opponent; however, he is in a position to do a certain amount of spying (or sampling) which costs him money.

The statistician's problem is to pick a strategy which decides how much he is to spend on spying, when he is to act in the game, and what action to take. Chapters V to XII deal intensively with this problem and contain several useful illustrative examples fully worked out.

This book should be of great use to statisticians. It will present difficulties to the average economist, but the discussion of action under uncertainty merits his attention.

M. SHUBIK.

British Post-War Migration. By JULIUS ISAAC. National Institute of Economic and Social Research. Occasional Papers 17. Cambridge University Press. 1954. xix + 310 pp. 30s.

" The primary object of the study is to examine the amount and significance of migration to and from Britain in the economic and social setting of the post-war years. Hence the book begins with a report on the facts . . ." The inadequacy of migration statistics is a by-word, but the author has taken great pains to collect and examine a mass of ancillary statistics to close the gaps as far as possible. Much of this material is controlled by government departments, without whose active co-operation a first-class study could hardly have been attempted, but it is evident that the author had such co-operation. The report therefore starts with the best account in existence of the statistics of post-war British migration. The remainder of the study is built on this foundation.

In no previous period of her history can British migration have been so complex as in the five years following the Second World War. To name but a few of the currents, there was emigration of the G.I. brides to Canada and the U.S.A.; migration of officials and servicemen from India and to Germany; and immigration of Poles and refugees, and foreign labour recruited on the Continent. These were " temporary " movements, which obscure the " normal " components of migration with which they are intermixed in the statistics of the period. An understanding of the significance of British migration in this period is thus a matter requiring most careful research to disentangle the components and relate each to its appropriate background. Dr. Isaac does just that.

The forces of repulsion and attraction (and the relative attraction of alternative destinations) are considered, and the effects of migration on donor and receiver countries. In the penultimate chapter, the desirable demographic and economic future of Britain and the extent that migration may help or hinder its achievement is examined, compared with the course that migration may be expected to take.

The author is to be congratulated on producing what cannot fail to be a standard reference work in its field.

N. H. CARRIER.

Two Post-War Recoveries of the German Economy. By HORST MENDERSHAUSEN. North Holland Publishing Co., Amsterdam. 1955. 128 pp. 24s.

During any given period there is usually one overriding problem that occupies, almost to the exclusion of everything else, the thoughts, the writings, the lectures of economists. In the United Kingdom of the 'twenties it was the return to the gold standard. In the 'thirties everywhere it was unemployment. After the war British economists have been obsessed with the dollar problem. German economists, on the other hand, have had quite a different spectacle to watch—not a series of St. Georges from the Treasury battling with a very unreluctant dragon, but rather a giant awakening.

This " German economic miracle " has been analysed in everything from the most learned econometric journal to the *Reader's Digest*. Within a very small space Mr. Mendershausen achieves the miracle of analysing the recovery of the years 1946–1953 by comparing it with the recovery from the first world war, in the years 1919–1928. The book grew out of a series of lectures at Columbia University, and its lucidity and brevity are among its greatest advantages. To the non-specialist, its broad sweep of events, its frequent use of tables and graphs are all of much greater value than many pages of detailed and intricate analysis.

So much has been said and written about Germany's economic progress in these last few years that Mr. Mendershausen has performed a very useful service in setting it side by side with the earlier period. There is a surprising degree of similarity between the two. In both cases, the area included in the " German economy " was altered by the post-war settlement; in both cases her external relations were severed or extremely restricted. In both cases the fever of inflation ravaged the economy for a number of years after the end of the fighting, and in both cases a drastic surgical operation—a currency reform—lowered the patient's temperature and set her, still a little groggy, on her feet again.

Within a few pages Mr. Mendershausen reviews the course of industrial and agricultural production, national income and foreign trade in the two periods, and in the four succeeding chapters describes, first the political, geographical and monetary situations at the end of the fighting; the processes of economic growth in the two deployment periods; Germany's internal economic balance, and finally her economic integration with other countries. The final result is a well written, well documented and most satisfactory survey.

R. G. OPIE.

The Growth of Integrated Oil Companies. By JOHN G. MCLEAN and ROBERT WM. HAIGH. Graduate School of Business Administration, Harvard University, Boston. 1954. xxiv + 728 pp. 96s.

This massive work contains the results of a remarkably detailed investigation of vertical integration in the American oil industry. Statistics of the nature and extent of backward and forward integration by the leading companies engaged in oil refining in 1950 are presented and commented upon, and a mass of statistics, discussions of particular decisions by individual companies, and general description and analysis are used to explain the growth and changes in vertical integration, particularly in the last three decades. Instances of " disintegration " are also considered and there is a lengthy discussion of the position and problems of the small refiner in the oil industry. The book is a compendium of information and a helpful guide to any one who is interested in the problems of vertical integration or of the oil industry. The generous scatter of case studies is particularly attractive. The reader is helped by good summaries to each chapter in a rather long book, and the statistics are well presented and clearly interpreted in the text.

The connection between vertical integration and monopolistic or oligopolistic control of the oil market has for a long time interested American economists and the American courts. The authors of this book conclude that the high degree of fluidity and change in the " integration patterns of the major oil companies is one excellent measure of the general intensity of competition in the industry ". But this rather begs the question of the effects of this oligopolistic competition generally and on the structure of the industry in particular.

B. S. YAMEY.

A Guide to Parliamentary Papers. By P. and G. FORD. Basil Blackwell. 1955. xiii + 79 pp. 7s. 6d.

Valuable reference works on British official papers prepared by Professor and Mrs. Ford were noticed in *Economica* in May 1952 (p. 229) and February 1954 (p. 87). A handy *Guide to Parliamentary Papers* now increases the great debt all research workers in the social sciences owe to Professor and Mrs. Ford.

The three Parts are headed " What They Are ", " How to Find Them ", and " How to Use Them ". These headings are sufficiently descriptive, except that the last does not convey the fact that the 13 pages concerned should be compulsory reading for all those—particularly students from abroad—who seek a full understanding of the United Kingdom's way of government. Librarians also should regard this book as belonging to their tool-bags: the last two pages of the book were written specially for them.

Most historians of the 19th and 20th centuries will, I imagine, admit that in years of research they have only picked up a mere fraction of the knowledge distilled in these 79 pages. Not one page can be spared: this little book is the best bookshop value in the social sciences for a long while.

R. S. SAYERS.

SHORTER NOTICES

Chartered Banking in Canada. By A. B. JAMIESON. The Ryerson Press, Toronto. 1953. x + 394 pp. Can.$5.

An up-to-date book which dealt adequately with commercial banking arrangements in Canada has long been needed and the present volume will provide a useful reference. The author is a Scot with over 40 years' practical banking experience in Canada and, while his work necessarily presents the point of view of the banker rather than the economist, it is an objective account, free of polemics, from which the academic student can gain much. The book is divided into two parts—" Foundations and Development " and " Banking Practice ". Part I provides the historical background and traces the growth of Canadian banking from its earliest days to the present. The way in which branch banking developed and the arrangements for the periodic revisions of the Bank Act are of particular interest. Part II provides both a detailed account of bank organisation and methods and of the types of business done. Incidentally, it provides a useful outline of the more important sectors of the Canadian economy.

Principles and Practices of Money and Banking. By CHARLES R. WHITTLESEY. Revised Edition. The Macmillan Co., New York. 1954. xiii + 579 pp. $6.25.

This has already proved itself an excellent textbook and a revised edition providing a more general treatment than that previously attempted is therefore to be warmly welcomed. There is a nice balance between factual description (though, because of its origins, this is restricted almost entirely to United States experience), and the fundamentals of monetary and banking theory. The most important change in this edition concerns money and banking in relation to the determination of the level of business activity, but there is much new material besides. It is the author's hope that he has helped to bridge the gap between college classroom and the world of affairs. In this, he has been markedly successful.

British Trade Unionism. Revised Edition. Five Studies by P. E. P. 1955. 199 pp. 16s.

The first edition of this work, published in 1948, was hailed as the most valuable contribution to the literature on labour organisations that had appeared since before the war. The new edition covers substantially the same ground as the old one, but each section has been rewritten and the basic statistics have been brought up to date. Unfortunately, the editing appears to have been lax, and a large number of minor errors have been allowed to remain in the text. For example, on page 50 we are told that the number of members on the Labour Party's National Executive Committee is 28 and on the next page 27. Notwithstanding slips of this nature this book is a good introduction to the study of trade unions.

The Industrial Development of Switzerland. By A. C. HUNOLD. National Bank of Egypt, Cairo. 1954. 45 pp. S.Fr.5.

This little book consists of four lectures given by a Swiss economist visiting Egypt. It offers, to Egyptians contemplating industrialisation of their country, a sketch of Swiss industrial success during the last two centuries, emphasising at every turn the importance of private initiative. It includes brief accounts of the cotton, engineering, watch and chemical industries, and concludes with a discussion of the social, political and economic conditions in which Switzerland has become comparatively highly industrialised. The moral which Dr. Hunold points for Egypt, as a country with industrial ambitions, is reliance on " the development of the free and individualistic spirit " rather than upon any economic planning.

The International Bank for Reconstruction and Development, 1946-1953. Johns Hopkins Press. Geoffrey Cumberlege. 1954. 273 pp. 32s.

This book, prepared inside the International Bank, provides a comprehensive documentation of the Bank's establishment and activities. The three parts cover—its purposes, organisation and financial structure; the general character of the Bank's operations; and a country-by-country summary. With the appendices, these three parts cover all the factual material any student is likely to require. There is no pretence at any assessment of the Bank's value, but by implication there is ample justification for its establishment. The record of no default suggests little of that adventurousness for which some of the Bank's sponsors hoped, but there is much evidence of initiative.

Reprints in Economics and Economic History. Issued by the Faculty of Economics, University of Sydney. 1954.

1. Report on the High Price of Bullion, with Minutes of Evidence.
2. Review of the Controversy respecting the High Price of Bullion: ascribed to T. R. Malthus.
3. Five Papers on Political Economy: T. R. Malthus, edited by C. Renwick.

This series of reprints deserves to be widely known and warmly welcomed. The re-issue of an interesting selection of Malthus' shorter writings does something to counterbalance the immense attention recently attracted to Ricardo.

Economic Survey of Europe in 1954. United Nations, Economic Commission for Europe. Geneva. 1955. Text 195 pp.; statistics 78 pp.; notes on sources and methods 38 pp. 17s. 6d.

This latest survey is the eighth in the annual series and, as usual, includes both an analysis of contemporary economic problems, programmes and prospects in Eastern and Western Europe, and a survey of certain longer-term issues. The first five chapters deal with current economic events—the economic upswing in Western Europe and its background (37 pp.); recent changes in the economies of Eastern Europe (27 pp.); economic development in the Soviet Union (20 pp.); trade and payments of Western Europe (25 pp.); and the foreign trade of Eastern Europe and the Soviet Union (27 pp). A sixth chapter provides a sequel to the survey of Europe's own " underdeveloped area ", the south-eastern countries, in an examination (36 pp.) of the problems of the backward regions to be found within all European countries. Finally, chapter 6 analyses (24 pp.) the problems of the French economy, which are in themselves largely regional.

How Money is Managed. By P. EINZIG. Penguin Books. 1954. vi + 358 pp. 2s. 6d.

This book suffers from trying to do too much at once. According to the author his object " . . . is to present a broad picture covering the entire field of monetary policy in the wider sense of that term ", while the book's jacket announces that it is written " . . . in simple language, understandable to the average reader of newspapers ". As to the first of these, the very width of the field covered, touching as it does upon many countries and periods, and the device of dividing the main part of the book into two parts dealing with ends and means respectively, leaves the reader without any sense of orderly development, and to laymen and students this is a severe drawback. As to the second, the language may be simple, but the theoretical ideas and institutional mechanisms in this field are not simple, and as these are not brought out clearly it may be doubted whether non-specialist readers will get very much out of many parts of the book. Some of the chapters are of interest, but the book as a whole does not seem very suitable for laymen or students and it will not satisfy the specialist.

Produktion. By W. G. WAFFENSCHMIDT. Anton Hain, Meisenheim/Glan. 1955. 255 pp. Dm.17.50.

This is a fairly advanced textbook of the theory of production. It is a sound work, remarkable rather for the extensive use of elaborate geometrical illustrations (there are 98 diagrams) than for the novelty of the propositions which are demonstrated. A welcome feature is an attempt to fill some of the economic boxes with empirical data, and to show how the theory of production is related to business practice. The numerous methodological and historical passages and the detailed proofs of theorems are printed in small type for the convenience of the reader who is short of time.

The Finance of Higher Education. Revised Edition. By JOHN DALE RUSSELL. Chicago University Press. Cambridge University Press. 1954. xix + 419 pp. 56s. 6d.

This book is not, as the title may appear to suggest, a study in public finance, but a *vade mecum* for the financial administrators in American Universities. It is sufficiently general in approach to provide an interesting discussion of the different problems facing the non-profit making institution compared with the individual business in controlling its finances. Particularly interesting is the discussion on the use of cost accounting methods in determining the " efficiency " of educational provision. A useful summary is also provided of the trends in the sources of income and types of expenditure of American colleges, and each chapter is concluded with a comprehensive bibliography.

Our Economic Problem. 4th Edition. By P. A. WADIA and K. T. MERCHANT. New Book Company, Bombay. 1954. xviii + 737 pp. Rs. 8.

This new edition of Professors Wadia and Merchant's well known work—*Our Economic Problem*—is to be warmly welcomed. Year by year it becomes more difficult to keep abreast of modern economic developments and policies in the Indian Union. What *Our Economic Problem* does is to give a bird's eye view of many aspects of these developments in a very modest space, which—even if it skims rapidly and sometimes superficially over certain problems and policies—does at least guide the reader over difficult ground, helping him to pick out for further study those aspects in which he may be particularly interested, and those for which Professors Wadia and Merchant's materials and discussions are clearly inadequate for full understanding and analysis.

The authors are to be congratulated on a valuable volume, and earn our gratitude by the promptitude with which they bring their work as nearly up to date as is possible.

International Economic Papers. No. 4. Translations prepared for the International Economic Association (ed. A. T. PEACOCK, W. F. STOLPER, R. TURVEY, ELIZABETH HENDERSON). Macmillan. 1954. 229 pp. 15s.

This is the fourth set of translations prepared under the auspices of the International Economic Association. The nine articles cover the period from 1918 to the present, and are spread as widely between topics and sources as they are over time. The two contributions with perhaps the most general interest will be the translation of the celebrated preface to the French edition of Keynes's *General Theory* and Lange's article " The Economic Laws of Socialist Society in the Light of Joseph Stalin's Last Work ". There is also a translation of Schumpeter's " The Crisis of the Tax State " (1918), which has worn well enough to have more than the obvious historical interest. Other papers deal with the static supply curve (Luigi Amoroso, 1930), wage-fixing according to the price index (Jørgen Pederson, 1952), inflation and the behaviour of social groups (Henri Aujac, 1950), capital formation and economic development (Celso Furtado, 1952), economic plans and causal analysis (Johan Åkerman, 1942), and the acceleration principle and the propensity to import (Herbert Giersch, 1953). The standard of translation is uniformly good.

A Policy for Skilled Manpower. By The National Manpower Council. Columbia University Press. 1954. xxv + 299 pp. $4.50.

Technical advance de-skills some jobs but increases the total demand for skill. The 64 million people in civilian employment in the United States contain some eight or nine million skilled workers and under half a million technicians. Three out of five of them at present get their training informally on the job. The object of this inquiry was to find how the supply of such skill could best be maintained and augmented. The chief recommendations are that the contribution of secondary education be raised, vocational guidance be extended, restrictions on entry into skilled trades be removed, and training methods be overhauled.

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The Nature and Role of Originality in Scientific Progress

By George J. Stigler

We set great store on originality in economics. Cournot was a great economist because he was original; Mill was not a great economist—only a great expositor—because he was not original. At times the attitude is carried to such extremes that we admire a man for his original and ingenious absurdities: he has a seminal mind. Even when we stop short of this curious perversity, we like to associate each eminent economist with the doctrine he originated. Jevons—marginal utility; Walras—general equilibrium; Marshall—quasi-rents, long and short run; Wicksteed—Euler's theorem; Pigou—private and social marginal products; Thünen—$\sqrt{ap}$; and so it goes on. If we cannot associate a catchword with the man, we are inclined to deny him originality.

Originality is decidedly a fine virtue, and I have no desire to praise the mind that devotes itself exclusively to an almost incestuous admiration of earlier wisdom. But originality is a more complicated virtue than most discussion seems to recognize, and its role in the progress of science is not easy to state or to assess. It is to these matters that this essay is devoted.

I. The Meaning of Originality

Originality has as its simplest meaning the temporal priority in the statement of an idea. Marshall was the first man to write that

$$\text{elasticity of demand} = -\frac{dq}{dp}\,\frac{p}{q},$$

and hence he is the originator of this concept. Cournot was the first man to analyze the two-firm industry: he is the originator of duopoly theory. Bowley originated the generalization of this analysis, by introducing the rate of change of one duopolist's output with respect to his rival's output.

Even at the level of specificity of these examples, however, we should notice the extreme difficulty of ascertaining the earliest statement. Marshall was the first to write the equation defining elasticity, but Cournot almost wrote it[1], and the whole literature of the pre-Marshallian

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[1] "Suppose that when the price becomes $p + \Delta p$, the annual consumption as shown by statistics, such as custom-house records, becomes $D - \Delta D$. According as:

$$\frac{\Delta D}{\Delta p} < \text{ or } > \frac{D}{p}$$

the increase in price, Δp, will increase or diminish the product $p\,F(p)$; . . .". *Mathematical Principles of the Theory of Wealth* (New York, 1929), pp. 53–4.

period teems with discussions of it[1]. Bowley's generalization of Cournot had previously been made by Kotany[2]. I do not know a respectable discussion of duopoly before Cournot's, but not all the returns are in.

And when an idea is more than a technical definition or highly specific analysis, the temporal priority is hopelessly obscure. Who first discovered diminishing marginal utility, or diminishing returns, or the quantity theory, or the theory of underemployment equilibrium? I do not know, but it is common knowledge that all such ideas have long histories before they are stated by the men who made them important.

It is not an accident that one can find anticipations of every "discovery" that was important in the sense of influencing the course of scientific thought. At any time there is a sort of frequency distribution of the scientific views of members of a science. Some men hold to the ideas of the past, most have a more or less similar position—which is therefore the current view—and a few are in diverse ways radical. (At closer view, a man often falls in all three classes, being radical in some branches of the discipline, with the crowd in others, and behind it in still others. Malthus was a leader in population theory, a Ricardian of sorts in value theory, and a physiocrat on agriculture.) Great economists are those who influence the profession as a whole, and this they can do only if their doctrines do not involve too great a change from the views and knowledge of the rank and file of the science. It is simply impossible for men to apprehend and to adopt wholly unfamiliar ideas. If it be true that science, like nature, moves at most by short jumps, it is highly probable that the great new ideas of any period will have found an earlier and neglected statement.

Originality may also be subjectively first in time. (A few years ago when one of my friends remarked that output was at a maximum under competition, a young French economist replied: "I proved that in 1940".) Great economists usually discover their leading ideas rather than excavate them from the literature. This is an interesting problem for the students of the psychology of invention, but it makes no difference to the science whether its new ideas come from current or past originality.

Scientific originality in its important role should be measured against the knowledge of a man's contemporaries. If he opens their eyes to new ideas or to new perspectives on old ideas, he is an original economist in the scientifically important sense. It is in this sense that all great economists are necessarily original. Smith, Ricardo, Jevons, Walras,

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[1] For example, Gossen made the elasticity of unity the dividing line between luxuries and necessities; *Entwickelung der Gesetze des menschlichen Verkehrs* (3rd ed. Berlin, 1927), p. 136. For a crude definition of elasticity, see W. Whewell, "Mathematical Exposition of Some Doctrines of Political Economy", *Transactions of the Cambridge Philosophical Society*, III (1830), pp. 201 *et seq.*

[2] "Suggestion on the Theory of Value", *Quarterly Journal of Economics*, XIX (1904–06), pp. 583–84.

Marshall, Keynes—they changed the beliefs and interests of economists and thus changed economics.

It is conceivable for an economist to be ignored by contemporaries and yet exert considerable influence on later generations, but this is a most improbable event. He must have been extraordinarily out of tune with (in advance of) his times, and rarely do first-class minds throw themselves away on the visionary. Perhaps Cournot is an example of a man whose work skipped a half a century, but normally such men become famous only by reflecting the later fame of the rediscovered doctrines.

Originality, then, in its scientifically important role, is a matter of subtle unaccustomedness—neither excessive radicalism nor statement of the previously unformulated consensus.

II. THE TECHNIQUE OF PERSUASION

Suppose I get a " new " idea and gradually work it (and myself) into the state where I believe that it is scientifically important. I may then find it in earlier writers, for now I am sensitive to the subject and look more searchingly and sympathetically at the relevant writings. Then I take up my pen, and write:

> I submit for critical appraisal my recent thoughts on linear oligopoly These thoughts, which were first presented by Süssmilch in 1745, by Say in 1814, and then became so common as to reach the United States by 1870, are by no means of major significance. In fact if they are improperly utilized they will probably lead to serious error. Yet under certain conditions, which I am not fully able to specify, they offer promise of a minor usefulness.

Will my fellow economists read on—once they get used to the novelty of this approach ?

No. New ideas are even harder to sell than new products. Inertia and the many unharmonious voices of those who would change our ways combine against the balanced and temperate statement of the merits of one's " original " views. One must put on the best face possible, and much is possible. Wares must be shouted—the human mind is not a divining rod that quivers over truth.

The techniques of persuasion also in the realm of ideas are generally repetition, inflated claims, and disproportionate emphases, and they have preceded and accompanied the adoption on a large scale of almost every new idea in economic theory. Almost, but not quite, every new idea. A few men have such unusual powers that their contemporaries recognize their claims without the usual exaggerations: Smith and Marshall are the only economists who seem to me indisputably to belong in this supreme class.

The rest have employed in varying degrees the techniques of the huckster. Consider Jevons. Writing a *Theory of Political Economy*, he devoted the first 197 pages of a book of 267 pages to his ideas on utility ! Or consider Böhm-Bawerk. Not content with writing two volumes, and dozens of articles, in presenting and defending his capital theory, he added a third volume (to the third edition of his *Positive Theorie des Kapitals*) devoted exclusively to refuting, at least to his own satisfaction, every criticism that had arisen during the preceding decades.

Although the new economic theories are introduced by the technique of the huckster, I should add that they are not the work of mere hucksters. The sincerity of Jevons, for example, is printed on every page. Indeed I do not believe that any important economist has ever deliberately contrived ideas in which he did not believe in order to achieve prominence: men of the requisite intellectual power and morality can get bigger prizes elsewhere. Instead, the successful inventor is a one-sided man. He is utterly persuaded of the significance and correctness of his ideas and he subordinates all other truths because they seem to him less important than the general acceptance of his truth. He is more a warrior against ignorance than a scholar among ideas.

Nor do I argue that a strong conviction of the validity of one's ideas and energetic dissemination are sufficient to alter significantly a science's work. It is possible by mere skill of presentation to create a fad, but a deep and lasting impression on the science will be achieved only if the idea meets the more durable standards of the science. Among these standards is truth, but of course it is not the only one.

III. The Case of Mill

John Stuart Mill is a striking example with which to illustrate the foregoing remarks. He is now considered a mediocre economist of unusual literary power; a fluent, flabby echo of Ricardo. This judgement is well-nigh universal: I do not believe that Mill has had a fervent admirer in the twentieth century.

I attribute this low reputation to the fact that Mill had the perspective and balance, but not the full powers, of Smith and Marshall. He avoided all the tactics of easy success. He wrote with extraordinary balance, and his own ideas—considering their importance—received unbelievably little emphasis. The bland prose moved sedately over a corpus of knowledge organized with due regard to structure and significance, and hardly at all with regard to parentage.

One must search carefully in Mill's *Principles* to discover his own ideas. The only one of which he boasts—the immutability of the laws of production vs. the social plasticity of the laws of distribution—is at least unhappy. The rest receive no fanfare: Mill devoted some seven pages to summarizing the work of John Rae on capital accumulation and one paragraph to his own important idea of non-competing groups.

Yet however one judges Mill, it cannot be denied that he was original. In terms of identifiable theories, he was one of the most original economists in the history of the science. I shall list his major contributions, each of which was at least as original to him as any important theory is to the person with whom it is chiefly associated. The list is restricted to value theory—although we must remember that what shreds of originality Mill is commonly credited with were in international trade theory—because I can be more confident of the priorities.

1. Non-competing Groups

> So complete, indeed, has hitherto been the separation, so strongly marked the line of demarcation, between the different grades of labourers, as to be almost equivalent to an hereditary distinction of caste; each employment being chiefly recruited from the children of those already employed in it, or in employments of the same rank with it in social estimation, or from the children of persons who, if originally on a lower rank, have succeeded in raising themselves by their exertions.[1]

Smith's illustrious discussion of differences in wages was limited to differences consistent with full occupational mobility of the labour force in the long run. Mill made the first major advance beyond this theory by his recognition of the barriers to mobility erected by the costs of education.

2. Joint Products

Mill clearly formulated the problem of joint production, i.e., production of two or more products in fixed proportions. He gave the complete and correct solution: the sum of the prices of the products must equal their joint cost, and the price of each product is determined by the equality in equilibrium of quantity supplied and quantity demanded.[2]

3. Alternative Costs

> Land is used for other purposes than agriculture, especially for residence; and when so used, yields a rent, determined by principles similar to those already laid down. The ground rent of a building, and the rent of a garden or park attached to it, will not be less than the rent which the same land would afford in agriculture . . . .
>
> But when land capable of yielding rent in agriculture is applied to some other purpose, the rent which it would have yielded is an element of the cost of production of the commodity which it is employed to produce.[3]

This was a frank and clear recognition of the fact that rent is a cost of production even from the social viewpoint when land has alternative uses. Marshall was unwilling to depart thus far from Ricardian theory.

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[1] *Principles of Political Economy* (Ashley edition), p. 393.
[2] *Ibid.*, p. 570.
[3] *Ibid.*, pp. 475, 479.

4. THE ECONOMICS OF THE FIRM

Mill's chapter (Bk. I, c. IX), " Of production on a large, and production on a small, scale ", is the first systematic discussion of the economies of scale of the firm to be found in a general economic treatise. It would take us afield to analyse this chapter in detail, but we may point out that Mill was the first economist to notice that one can deduce information on the costs of firms of different sizes from their varying fortunes through time.[1]

5. SUPPLY AND DEMAND

Mill introduced into English economics the concept of demand as a schedule or function, and hence was able to state the " law of supply and demand " clearly and with substantial accuracy:

> Demand and supply, the quantity demanded and the quantity supplied, will be made equal. If unequal at any moment, competition equalizes them, and the manner in which this is done is by an adjustment of the value. If the demand increases, the value rises; if the demand diminishes, the value falls: again, if the supply falls off, the value rises, and falls if the supply is increased .... the value which a commodity will bring in any market is no other than the value which, in that market, gives a demand just sufficient to carry off the existing or expected supply[2].

This is, to be sure, very obvious once announced, but its explicit development was a highly useful addition to the Ricardian economics. Mill used the apparatus very competently in dealing with Thornton's absurd objections to the " law ".[3] (I do not assert that Mill's discussion was superior to all earlier discussion; Cournot in particular was more precise.)

6. SAY'S LAW

Mill's discussion of the limitations to the proposition that there cannot be an overproduction of all commodities was penetrating as well as original:

> This argument is evidently founded on the supposition of a state of barter; and, on that supposition, it is perfectly incontestable ....
>
> If, however, we suppose that money is used, these propositions cease to be exactly true ....
>
> Interchange by means of money is therefore, as has been often observed, ultimately nothing but barter. But there is this difference—that in the case of barter, the selling and the buying are simultaneously confounded in one operation; you sell what you have and buy what you want, by one indivisible act, and you cannot

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[1] *Ibid.*, p. 134.
[2] *Ibid.*, p. 448.
[3] " Thornton on Labour and its Claims ", in *Dissertations and Discussions*, Vol. 5.

> do the one without doing the other. Now the effect of the employment of money, and even the utility of it, is, that it enables this one act of interchange to be divided into two separate acts or operations, one of which may be performed now, and the other a year hence, or whenever it shall be most convenient.[1]

It follows that at a given time people may wish to hasten sales and to postpone purchases, and this is then a period of " general excess ".

> In order to render the argument for the impossibility of an excess of all commodities applicable to the case in which a circulating medium is employed, money must itself be considered as a commodity. It must, undoubtedly, be admitted that there cannot be an excess of all other commodities, and an excess of money at the same time.[2]

Say's law therefore is not inconsistent with the existence of periods of general excess and general deficiency, which arise out of the " unreasonable hopes and unreasonable fears (which) alternately rule with tyrannical sway over the minds of a majority of the mercantile public ".[3] Is this essay, written about 1830, the work of an unoriginal mind ?

This is a very respectable list of contributions. But it is also a peculiar list: any one of the contributions could be made independently of all the others. Mill was not trying to build a new system but only to add improvements here and there to the Ricardian system. The fairest of economists, as Schumpeter has properly characterized Mill, unselfishly dedicated his abilities to the advancement of the science. And, yet, Mill's magisterial quality and conciliatory tone may have served less well than sharp and opinionated controversy in inciting his contemporaries to make advances.

IV. Originality and Scientific Progress

What do we mean by scientific progress ? An empirical science is a body of related generalizations with empirical content, as it is known to the group of competent students of the science.[4] The generalizations must be of a known degree of reliability or precision; otherwise the predictions based upon them are acts of faith rather than of analysis. The science is what the scientists know, not the storehouse of books which record all that past and present scientists have ever known. Knowledge can be and has been forgotten, but I shall pass over the problems of professional literacy and memory. A science progresses, then, when a new generalization is discovered, or is made more discoverable, when an existing generalization is refined analytically, or when an existing hypothesis is " confirmed " or shown to be false.

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[1] *Essays on Some Unsettled Questions of Political Economy* (London, 1844), pp. 69–70.

[2] *Ibid.*, p. 71.

[3] *Ibid.*, p. 68.

[4] A case can be made for the view that a science includes also a body of techniques, but more persuasively for the alternative view that the techniques are servants of the generalizations.

If these are the major components of scientific progress, it is demonstrable that progress may take place without any important originality.[1] Three kinds of work, requiring no more than diligence and professional competence (but of course allowing high originality), contribute to scientific progress.

The first kind of work is the testing of hypotheses. The numerous predictions of the level of employment which were shattered in 1946 were not original work, but served to test the widely accepted hypothesis that the consumption function was stable in the short run. The demonstration of error in a widely held hypothesis is an important part of scientific progress. Similarly, Kuznets' study of savings in relation to national product since 1869, which was also more courageous than original,[2] served to test the hypothesis that the consumption function was stable in the long run. This role of empirical work is too familiar to require elaboration.

The second kind of work is the accumulation of knowledge. It is excessively easy to start a quarrel by appearing to praise unmotivated collections of facts or by implying that one should collect only those facts which are specified by a heaven-inspired hypothesis, but I hope to avoid both quarrels. All that need be asserted here is that streams of empirical work, frequently but not necessarily embodying much critical and analytical originality, have given rise to major theoretical innovations. An example would be the inductive studies of prices initiated by Jevons and Laspeyres,[3] which played a major role in the development of monetary theory. Indeed I think one can predict that theoretical systems will eventually appear in areas where much empirical work is going on: for example, we may expect a number of new theories of income distribution in the next decade.

The third kind of useful but unoriginal work will serve to remind us that empirical work is not the only unoriginal work. The refinement or elaboration of a theory is often an essentially routine task. Indeed, any reader of the journals knows that most theoretical work is essentially repetitive, and dominated by fashion. One must look to accidental personal circumstances, and not to nature's distribution of high intellectual gifts, to explain who first applies monopolistic competition theory to foreign trade, or who first applies input-output analysis to regions, or who generalizes price discrimination theory from 2 to *n* markets, or who first puts income distribution into a consumption function. Not the least of the useful purposes served by such work is that of allowing respectable reiteration of a basic idea until everyone who can read has learned it.

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[1] No doubt every non-repetitive act has some element of novelty, and the highest flights of originality incorporate much well known information, but both truths do not destroy the distinction between the two kinds of work. The basic tests are whether the work can be assigned to a merely competent economist and whether a merely competent economist would assign it.

[2] Kuznets' basic work on national income, however, was of a high order of constructive analysis.

[3] Jevons, " A Serious Fall in the Value of Gold Ascertained, and its Social Effects Set Forth ", reprinted in *Investigations in Currency and Finance* (London, 1909); and Laspeyres, " Hamburger Waarenpreise ", *Jahrbücher für Nationalökonomie und Statistik*, III (1864).

These not very original kinds of empirical and theoretical work are sufficient to allow indefinite progress in a science. One is entitled to conjecture, however, that although the progress could be indefinite, it would not be large. Unless a science is thoroughly shaken up from time to time, its practitioners tend to become a spiritless and stultifying lot. They drift into a rigid orthodoxy, and fail to maintain even the kinds of progress of which they are capable. Significantly original work, with its consequent controversies, feuds, victories and defeats, appears necessary to maintain the esprit of a science.

If scientific progress can continue, at least for a time, without originality, originality may also impair progress. Originality means difference, not improvement, and one may invent new errors as well as new truths. The equations of Keynes' *Treatise on Money* were original but not useful; the work on business cycles by Henry Moore was highly original, but not useful; the statistical work on the 200 largest non-financial corporations was original, but not useful.

Quite aside from the fact that much original work is mistaken, an excessive rate of production of original work may retard scientific progress. It may appear a paradox to assert that progress, consisting in large part of " good " originality, can be impaired by an excess of such originality, but the explanation lies in the fact that a high rate of innovation in a science reacts upon the quality of the innovations.

A new idea does not come forth in its mature scientific form. It contains logical ambiguities or errors; the evidence on which it rests is incomplete or indecisive; and its domain of applicability is exaggerated in certain directions and overlooked in others. These deficiencies are gradually diminished by a peculiar scientific ageing process, which consists of having the theory " worked over " from many directions by many men. This process of scientific fermentation can be speeded up, and it has speeded up in the modern age of innumerable economists. But even today it takes a considerable amount of time, and when the rate of output of original work gets too large, theories are not properly aged. They are rejected without extracting their residue of truth, or they are accepted before their content is tidied up and their range of applicability ascertained with tolerable correctness. A cumulative slovenliness results, and is not likely to be eliminated until a more quiescent period allows a full resumption of the ageing process.

Yet it would probably be unwise, as it would certainly be futile, to wish for a steady rate of innovation in a science—the unpredictable course of scientific work is an element of its adventure. But it seems to be of the nature of original work to come and go in surges: economics was stuffy from 1850 to 1870 and sedate from 1900 to 1914, and there was possibly an excess of originality in the 1930's. The members of a science are also more receptive to new ideas at one time than at another, but this is a large separate problem in its own right.

These reflections on the nature and role of originality, however, have no utilitarian purpose, or even a propagandistic purpose. If I have a prejudice, it is that we commonly exaggerate the merits of originality in economics—that we are unjust in conferring immortality upon the authors of absurd theories while we forget the fine, if not particularly original, work of others. But I do not propose that we do something about it.

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Competition in the Retail Grocery Trade 1850–1939[1]

By F. G. PENNANCE and B. S. YAMEY

This article outlines the principal events in the development of competition in the retailing of groceries and provisions between 1850 and 1939. Special attention is given to price competition, both because it was a marked and pervasive feature of business behaviour during the major part of the period and also because price competition (or its absence) figures prominently in present-day discussions on the nature of competition in retail markets.

The treatment in this article is non-statistical. It is not possible to express the extent or severity of price competition in quantitative terms; and statistics which might have been useful to illustrate parts of our historical account are not available.[2]

In the course of our discussion we refer to several of the attempts of organised grocers to regulate and reduce competition because they give some indication of the severity and character of competition at different times during the period covered. However, we do not present a history of organisations of retail grocers. It must suffice here to mention that during the second half of the nineteenth century numerous local associations of grocers were formed for a variety of reasons, and that the Federation of Grocers' Associations was founded in 1891. Among its many functions the Federation was from the beginning concerned with measures for the control of competition, though neither its activities nor those of the local associations had any appreciable effect on the course or intensity of competition.[3]

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[1] We acknowledge, with thanks, research assistance provided by the Economics Research Division of the London School of Economics.

[2] For example, there are no time series of gross margins on particular lines or in the grocery trade (however defined) generally.

J. B. Jeffery's recent study, *Retail Trading in Britain 1850–1950*, 1954, provides estimates of the shares of the trade handled by the main types of retail undertakings since 1850. Such statistics, though interesting in themselves, are of limited significance for our study of competition. The market influence of successful new types of firm was far greater than that suggested by the share of the trade handled by them. Moreover, the usual classification of retail undertakings for statistical purposes necessarily fails to take account of several characteristics which are important for the study of market behaviour (e.g., age of firm, price policy and range of merchandise handled). In particular the category which usually includes all retailers other than co-operative societies, department stores or multiples contains a heterogeneous collection of firms which did not have uniform pricing policies, methods of operation or attitudes towards competition.

[3] The associations and the Federation in the main represented the self-styled "legitimate" trade which, however, is not easy to define. Roughly, it referred to retailers who practised the more traditional or established methods of business, and who felt most keenly the impact of the emergence of new types of competitor or of novel methods. Since what was customary or established changed with the years, the nature of legitimate trade also changed.

Much of the material on which this study is based is derived from the files of the weekly paper, *The Grocer*.[1] This journal described and interpreted the changing scene and also carried detailed reports of the meetings of the major and of many of the minor trade organisations and of the measures adopted or advocated by these bodies. In the main the present study is based on the descriptions of events reported in the journal; the views and opinions of contributors to the journal have been examined largely to check our own interpretations of the reported developments.

ORGANISED CONSUMERS AND RETAIL COMPETITION

A hundred years ago grocery retailing was conducted by small and medium-sized firms. Consumer co-operative societies were in their infancy, department stores had not appeared on the scene, and the only multiple trading, if it can be called that, was the branch trading of some successful grocers who had expanded their trade locally.

Competition frequently took the form of wooing the customer with personal services and long credits. But some price competition was present, at least in the cities and larger towns. It was sharpest in the sale of sugar, and several of the earliest local grocers' associations were established with the aim of stopping this competition. However, selective price-cutting tended to develop into more generalised price competition.[2] Much of it was initiated by the larger firms which received preferential treatment from wholesalers, some of whom in addition engaged in retailing. The disadvantages of shops operating on a small amount of capital were recognised. Nevertheless, with the exception of the working-class trade in some of the larger cities and towns—and especially in London—the extent and the price-reducing effects of this early competition were limited. The fact that certain skills (e.g., in the blending of tea) were necessary in the grocery trade, the restricted mobility of customers, and the widespread practice of granting long credits (sometimes for a year or longer), all tended to restrain price competition.[3]

The first major changes and the first developments towards a more competitive retail trade were brought about by the action of organised groups of consumers who embarked upon retailing on their own behalf.

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[1] In the interests of brevity we have been sparing in the use of direct references to specific reports etc. in *The Grocer*, which is designated by the abbreviation *G*.

[2] An early editorial observed that " grocery stores have been established in different parts of London, and also in some of our chief towns, upon the professed principle of excluding sugar altogether from the list of articles to be procured at them, which exclusion is boldly averred to enable the proprietor of the store to supply tea, coffee, spices, etc., at a considerably lower rate than sugar-selling houses could afford to furnish them at ". (*G*, 22.2.1862, p. 120.) Frequent complaints by grocers about so-called " tea-only " shops point to the success of the policies of the latter, and show that it was difficult for grocers to recoup their " losses " on sugar by raising other prices.

[3] Competition in the sale of tea was restricted further because, until 1869, this article could only be sold under licence.

These organisations fell into two distinct groups—the working-class co-operatives which followed the model of the Rochdale pioneers of 1844, and the middle-class associations of the " civil service " type. Although there were similarities between the two forms, it is convenient to consider them separately, because of differences in their development.

Working-class co-operatives expanded rapidly in the second half of the nineteenth century. The number of societies submitting statutory returns had grown from about sixty in 1860 to over a thousand in the 1880's. From the beginning co-operative retailing was concerned predominantly with the sale of groceries and provisions and other food products.

The rise of the co-operative trading movement was connected with the development of working-class organisations generally. The principal *commercial* reason for their successful establishment in trade and their subsequent expansion lay in the practices followed by most of their private trade competitors in the middle of the nineteenth century. Price competition was sluggish, high gross margins were associated with slow rates of turnover and, perhaps most important, customers who were willing and able to pay cash for their purchases were usually required to bear part of the costs of the prevalent long-credit trading. The uncertain quality of some of the goods purveyed and the risk of adulteration also favoured the development of an alternative source and method of supply. Consumer control, cash trading and patronage dividends appeared attractive in the circumstances.

The establishment and growth of co-operative societies proved to be difficult where more competitive conditions in the grocery and provisions trade had prevailed before the development of co-operative trade. Thus working-class co-operative trading was slow to establish itself in London, and played only a minor role in the movement towards a more effectively competitive retail market. Competitive private trading in Birmingham and Liverpool and, to a lesser extent, Manchester presented a similarly formidable challenge to the co-operative movement. Nevertheless, once a society had become firmly established, it was difficult for private retailers to regain the custom of supporters of the co-operatives even if they adopted the societies' successful policies, including the payment of patronage dividends in many cases. Loyalty to the societies in some areas was very strong.

The " civil service " type of consumer co-operative society catered essentially for middle-class customers. After a group of civil servants had successfully launched the forerunner of the Civil Service Supply Association in 1864, several other societies such as the Civil Service Co-operative Society and the Army and Navy Co-operative Society were formed. By 1872 there were nineteen such societies or imitations of them in London and a few elsewhere, and there was strong competition among them. A large part of their trade at first was in groceries and wines; later the successful associations added many more departments and became universal providers.

The success of the London societies came as a surprise to contemporary observers, including their trade competitors, who were convinced that civil servants would have no aptitude for business. The reasons for their success were in part the same as those which contributed to the establishment and growth of the working-men's co-operatives. Cash trading had not been promoted by grocers catering for middle-class trade. Moreover, many West End tradesmen provided elaborate services, such as the availability of many sales people and extensive delivery services, which added to their costs. Douceurs to the servants of the more affluent raised costs and also the prices charged to all customers. In contrast, the middle-class societies worked on the basis of cash trading and with services drastically cut at first; in some societies the customer had to pay delivery charges on all orders below a specified amount. Prices were reduced markedly and the response of consumers showed that the new alternative to traditional sources of supply was widely appreciated.

Unlike the working-men's co-operatives the leading London societies did not pay patronage dividends; instead, they set their prices as low as was practicable, so that their impact on retail prices was more direct than that of the other societies which tended to follow ruling market prices. Like their predecessors the London societies attracted the existing and developing cash trade and forced many other retailers to follow their methods and prices.[1]

The origins and rise of co-operative retailing in England provide partial illustrative support for Wicksell's views on the functioning of competition in retail markets. He contended that competition did not lead to competitive price reductions but, instead, increased the number of retailers and raised retailing costs. His analysis led him to conclude that the " correct remedy [for reducing costs and number of firms in retailing], unless one of the [retailer] competitors (such as a great store) manages to overshadow all others, is clearly the formation of some form of organisation among buyers ".[2] But although, in England, both working-class and middle-class consumer organisations had made an important start, towards the end of the nineteenth century competitors from the ranks of the retailing community took over the task of sharpening the cutting-edge of competition. In the grocery trade the department stores and, to a greater extent, the multiples became the pace-makers. Indeed, by the turn of the century the two groups of co-operative societies were up against the competition of the new large-scale retailers and of the many small-scale grocers who had adapted their methods to cash trading and smaller gross profit margins.[1] The uneasiness caused by the rapid rise of the grocery multiples was reflected, for example, in the decision of the Co-operative Congress of 1912 to appoint a committee to investigate the causes favourable to the multiple system. By then it was apparent that the multiples presented a far more serious challenge to the co-operative societies than the attempts of organised retailers to harry them.[2]

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[1] Thus by 1886 it was reported that the societies " have reduced prices, it is true, but they have not reduced them very much below the rates which many private traders now quote to ready money purchasers who carry away their own purchases ". (Leading Article, *The Times*, 2.2.1886.)

[2] K. Wicksell, *Lectures on Political Economy*, Vol. 1, p. 88.

Although the trade of the working-men's co-operatives continued to grow, the societies were not responsible for any further major innovations during the period under review; they continued to be important competitors but were rarely at the spearhead of price competition.[3] On the other hand, the principal middle-class societies progressively shed their co-operative features and the surviving ones eventually became transformed into ordinary undertakings with forms of ownership and methods of trading indistinguishable from those of other large department stores. Increasing competition contributed to this process.[4]

LARGE-SCALE RETAILING, *ca.* 1880–1914

Department stores, or universal providers as they were called originally, developed in the second half of the nineteenth century. In the main they were the products of the growth of the businesses of individual drapers, grocers or other specialised traders, stimulated in some cases by the success of the major middle-class co-operative societies.[1] The operations of the universal providers intensified competition in many branches of retailing; groceries and provisions usually were a major department especially in the earlier years.[2]

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[1] On the latter, see, for example, editorials in *G*, 24.10.1896, p. 884 and 5.12.1896, p. 1262.

It may be mentioned that almost all the large-scale retailing firms started as small ones.

[2] These attempts were numerous and varied. For example, a Traders' Defence Association of Scotland was active for some years from 1888 with schemes to boycott wholesalers who supplied co-operative societies and to refuse employment to members of the societies. A few years later similar associations were formed in Hull and St. Helens; the latter had a short-lived scheme whereby members collectively operated a consumer dividend plan to meet co-operative competition.

The quick success of the middle-class societies in London gave rise to a series of trade deputations urging the government to curtail the trading activities of civil servants. Boycotts of their suppliers were attempted in the earlier years.

These schemes and others like them had little or no effect beyond giving publicity to the societies.

[3] They had a marked indirect effect on competition since their large share in the distribution of branded groceries inhibited the development of effective resale price maintenance in the grocery trade; on this, see B. S. Yamey, *The Economics of Resale Price Maintenance*, 1954, ch. 8, *passim.*

[4] Outside the co-operative societies, further positive action on the part of organised consumers was confined to the formation of consumer guilds, credit clubs and discount associations of various kinds, which first began to appear towards the end of the nineteenth century. Though their influence was more important in certain other branches of retailing, even in the grocery trade their activities were sufficiently widespread to cause some disquiet throughout the period studied. (For example, the delegates representing the Grocers' Federation at a conference on wages convened by the Ministry of Labour in 1936 were instructed to urge the Ministry to support trade efforts to secure the banning of " staff trading " on government premises.)

The reactions of the legitimate trade to the competition of the department stores were mixed. On the one hand this form of trading was viewed as a sign of the times; an increased turnover from the sale of as many lines as possible was regarded as the appropriate method of adjustment to the narrower margins which were resulting from increased competition. On the other hand department store competition was keenly felt in some cities and grocers were hard pressed to meet it. In Manchester, for example, a decision to form a grocers' buying combination in 1885 was prompted largely by the success of " a large local shop which sells everything on the cutting system " (Lewis's in Market Street) and its " system of immense general store buying on the very best terms ".

The London middle-class societies and the department stores with their rail delivery services contributed to the geographical spread of competition; the influence of their price lists and favourable delivery rates or terms penetrated a fairly large area. By the turn of the century mail-order competition and the use of rail deliveries presented serious problems for local retailers in provincial centres and country towns in several branches of trade. It is of particular interest that provincial grocers should have been much influenced by this type of competition emanating from London. Distance combined with the bulkiness (and sometimes perishability) of groceries did not protect them from the long reach of price competition, which remained important in some areas even after local branches of multiple firms had been established.[3] The opposition of the Grocers' Federation and of other trade bodies to the proposal of the Postmaster-General to introduce cash-on-delivery postal facilities in 1904 gives some indication of the trade concern with long-distance competition in general.[1] Delivery by van and the development of telephone services also contributed to the spread of competition.[2]

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[1] " In every part of London gigantic businesses are taking the place of a multitude of smaller ones, and their owners entirely disregard the old divisions of trade. They will have cheese in one window, champagne in a second, cigars in a third, and ribands in a fourth. . . . Co-operation is largely responsible for this change, although the excessive multiplication of retail dealers would probably have led to something of the kind in any case ". (Leading Article, *The Times*, 26.5.1885.)

[2] A report in 1887 referring to Lewis's of Liverpool noted that " there is hardly one department of trade with which the company has not interfered, and by a process of ' cutting ' it has managed to gain a reputation in each. Prominent among the articles offered for sale . . . were groceries and provisions, the prices of which, under ordinary circumstances, could only have yielded a narrow margin of profit; but no doubt the multifarious transactions proved in the aggregate to be satisfactory ". (*G*, 1.1.1887, p. 12.)

[3] Many instances of the effects of London prices may be mentioned; three examples follow. Some grocers in Swansea believed they were unable to raise prices because of the competition of London stores. (*G*, 30.6.1900, p. 1766.) A Sherborne (Dorset) grocer complained of " the practice of many local residents and scholastic institutions making their purchases from London stores rather than from the tradesmen of the town ". (*G*, 7.12.1907, p. 1343.) Portsmouth grocers failed to get a local agreement on the price of a proprietary brand of coffee partly because the " Army and Navy Stores and other London Stores " were also cutting the price. (*G*, 12.3.1910, p. 724.)

The origins of the grocery multiples, which were to become the most important focus of price competition by the end of the nineteenth century, may be traced in part to developments in the tea trade following the fiscal changes in the 1860's. The duty on tea was reduced to one shilling per pound in 1863 and to fourpence two years later; the licensing of tea sales was abolished in 1869. Retail tea prices fell in consequence. The subsequent extension of the tea trade had several results, of which the major one in the present context was the growth of ' branch trading ' by tea wholesalers. This was an early and influential form of multiple trading in the grocery field. Some of the later multiples which developed independently of the tea trade nevertheless also adopted the title of ' tea ' stores, even though their business was neither confined to tea selling nor connected with wholesale firms.

By the middle of the 1890's grocery multiples had established branches in most large towns. It was reported that " they go everywhere nowadays, and even the smallest trader in the most remote part of the country is not wholly exempt from their maleficent influence ".[3] Reports from grocers' associations and correspondence from traders referred constantly to the establishment of new branches, and their arrival generally had an immediate effect on prices.[4] In some cases the effect on prices preceded the actual opening of the branch.[5] The multiples also put an end to the limited success which had previously attended the price-fixing arrangements of some local grocers' associations. They " have not only kept aloof from price-fixing schemes, but have gone into towns where an association has been trying to arrange reasonable prices, and opened businesses with the avowed object of breaking down what they have called ' grocers' rings ' ".[6] Buying in

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[1] The Postmaster-General gave way to the concerted opposition; the system was introduced eventually in 1926.

[2] For example, in 1900 it was reported that vans from neighbouring towns were appearing as travelling shops in rural districts on market day. (*G*, 3.3.1900, p. 607.) An editorial in 1909 (*G*, 8.5.1909, p. 1395) referred to the use of motor vans by London stores and the growing influence of the telephone system.

[3] Editorial, *G*, 30.4.1892, p. 904.

[4] For example, the establishment of a Lipton's branch in Nottingham in 1888 " tended to reduce the price of bacon and cheese all over the town ".

[5] Thus the knowledge that the Home and Colonial Stores were making enquiries in 1893 about real estate in Ramsgate was sufficient to produce real reductions in the local prices of goods handled by that firm.

[6] Editorial, *G*, 18.5.1895, p. 1184.

In fact, with few exceptions, local price agreements had little force. They encouraged price-cutting which generated ill-feeling among association members, so that by the 1890's grocers' associations grew chary of adopting resolutions on prices other than " judicious recommendations ".

Other agreements to regulate competition also were largely fruitless. Thus in 1901 John Williams, a leading Manchester grocer, told the Select Committee of the bulk and dealing in a limited number of lines—principally tea, butter,[1] margarine and cheese—the larger multiples were able to make a profit while selling at prices which were as demoralising to the single-shop trader as they were attractive to the growing numbers of cash customers.[2]

Competition grew as the number of firms and of branches increased, and during the first decade of the new century there were signs that the multiples were increasingly disturbed by the severity of competition among themselves.[3] In 1903 the chairman of the Maypole Dairy Company observed that there were " signs that new branches were being opened by Company firms faster than was warranted by the natural increase of trade ".[4] The annual reports of most of the major multiple companies in 1908 drew the attention of their shareholders to the fact of increased competition, and echoed the sentiment of the Home and Colonial report that 1907 was not a " shareholders' year " but a " customers' year ". Competition tended to be particularly severe when wholesale prices were rising, since the multiples, as pace-setters, were very reluctant to raise retail prices. This sluggishness in following rising markets was not a new tendency; it had merely become more pronounced.[5]

House of Lords on Early Closing of Shops of two cases where voluntary agreements on closing hours had broken down. In one case a pork-butcher who had not signed the agreement started selling groceries and kept his shop open later than the grocers. In the other a new grocer was attracted by the fact that there was an agreement among the grocers in the district.

Grocers' associations also had difficulties in trying to eliminate or to control the practice of giving Christmas presents or almanacs to customers.

[1] Cheap " milk-blended " butter was introduced into the London area by one multiple firm in 1901. Its sale seriously affected the butter trade which already had been the scene of active competition. While the legality of the sale of milk-blended butter was in dispute—a period of several years—the sale of the product was confined to a few multiples and some other aggressive retailers. Their competitors suffered a loss of trade in consequence; they referred to the offending product as " pearksified " or " pearksecuted " butter, after the name of the multiple which started the trade, or simply as " bashed " or " water-logged " butter.

[2] During the last quarter of the nineteenth century *The Grocer* in its editorial columns urged grocers to concentrate on cash trade because of its increased importance and the high costs of credit trade. By about 1900 it tended to change its attitude and encouraged grocers to cultivate the " weekly book " habit among customers to keep them away from the larger multiples who at that time generally did not sell on credit. In this connection it is of interest that some Rhondda Valley grocers were opposed to the enactment of the Coal Mines Bill in 1911 because they feared that the introduction of weekly wage payments would encourage patronage of ' cut-price ' shops.

[3] The general price competition was punctuated at intervals by intensified price wars between rival multiples. Thus it was reported in 1907 that " several of the largest of the multiple-shop firms appear to have adopted a policy of cutting retail prices to such an extent that they are in some instances offering to the public certain classes of goods at prices below those at which many grocers are able to buy on the open market .. . . One firm started by offering granulated sugar at 1½d., and colonial cheddar cheese at 7d. per lb.; and a rival company retorted by selling granulated at 1½d. and cheese at 6½d.; while a third multiple-shop concern has reduced the price of the latter commodity to 6d. per lb., and, in addition to this, is giving purchasers a bonus of a penny in the shilling ". (Editorial, *G*, 27.4.1907, p. 1103.)

[4] *G*, 28.2.1903, p. 673.

[5] The chairman of the Home and Colonial Stores observed in 1912 that costs (buying prices) had been high, " and when costs are high it means that it is more

It is not surprising that some of the multiples had become more willing to participate in limited price fixing arrangements; the legitimate grocers were no longer the sole sufferers from the price competition fostered by the multiples. Nevertheless, even with this support price-fixing was never effective for long.[1]

By the early years of the new century the passing of the old system, in which " each tradesman had his particular circle of patrons ", was acknowledged,[2] and there was much discussion of what was called the " passing of the grocer " and the decline of small-scale retailers generally. However, it was premature to predict the rapid elimination of the " independent " trader, for many grocers with small or medium-sized shops were able to hold their own against their larger rivals by improving their methods. In some cases they tried to improve their competitive position by pooling their purchases to get the benefit of quantity discounts; less frequently local groups of grocers joined forces to advertise the merits of independent shopkeeping or to bring out private brands of merchandise.[3] Moreover, even while large-scale retailing was expanding rapidly, other influences were swelling the ranks of small-scale grocers. The increase in the range of branded goods stimulated the entry of new retailers,[4] and the growing number of shops added to the cutting of prices.[5] Easy credit, a corollary of the parallel growth of competition in wholesaling, facilitated new entry. The rapid development of house and shop property was a contributory

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difficult for us to make a profit, because in those circumstances we always endeavour to meet our customers, and, notwithstanding adverse market conditions, to maintain, as far as it is possible to do so, the same level of retail prices ". (*G*, 10.12.1912, p. 405.) For a similar but earlier statement by the chairman of Lipton's, see *G*., 1.6.1901, p. 1606.

As early as 1864 there were references to the fact that the ' cutting mania ' in sugar was most marked when sugar prices were rising.

[1] The Retailers' Sugar Association, formed in 1904 with the object of fixing sugar prices in the London area, had the support of some multiples and its recommendations were effective for about two years. In 1907 it also announced retail prices for cheese, affirmed by all multiples with head offices in London. But within a month the main agreement on sugar prices had collapsed and attempts to revive it in 1910 failed completely.

Sometimes, but rather rarely, some of the main multiples had price agreements among themselves. An early example concerning tea is reported in *G*., 16.5.1903, p. 1483.

[2] Editorial, *G*., 28.5.1904, p. 1567.

[3] During the whole period covered in this survey there were no attempts at even closer and more continuous collaboration among independent grocers to meet the challenge of the multiples, though voluntary chains on the United States pattern were talked about in the 1930's.

[4] The growth of branding also encouraged " dabbling " by other retailers in the sale of groceries. The marketing of tea in packets, for example, encouraged some chemists, publicans and drapers to enter the trade. Some of this dabbling was in the nature of retaliation for the dabbling indulged in by many grocers.

[5] " Some correspondents complain of the multiplication of new shops in almost all localities, and argue that the competition thus engendered is suicidal . . . The question becomes, are local traders, as the saying is, too thick on the ground ? In many localities we are afraid that is the case; hence the cutting competition, which, at the present time, does such an infinity of harm." (Editorial, *G*., 7.4.1894, p. 816.)

factor, and the ease with which dwelling houses could be converted into shops was blamed for the expansion in the numbers of part-time traders, who often kept their premises open for business after other shops had closed.[1] Price-cutting by outgoing failures and price-cutting by their fledgling successors anxious to work up a trade accompanied the large number of bankruptcies and business failures.

The intense price competition and the failure of price-fixing arrangements among retailers not unnaturally gave rise to a movement to induce manufacturers to introduce resale price maintenance. In 1895 E. J. Smith, the champion of "New Trades Combination" in industry and the organiser of combinations in the bedstead-making and other Midland industries, brought forward a wholly improbable scheme for the fixing and maintenance of all retail prices in the grocery trade. Subsequent efforts to attain the more limited objective of the maintenance of resale prices of branded goods only were more realistic, but nevertheless were largely unsuccessful before 1914. Trade organisation was not strong enough to induce many manufacturers to come to the aid of those retailers who were suffering from competition.[2]

THE WAR AND INTER-WAR YEARS

During the First World War there was a marked abatement of price-cutting and of other forms of competition;[3] it was the only time within the last seven or eight decades of the period covered in this study during which there was a protracted respite from price competition throughout the country. The complete change in trading conditions favoured the small-scale and medium-scale legitimate grocers as a group. Shortages of supplies and rationing encouraged or obliged customers to remain loyal to one particular grocer, and hindered the expansion of new or more vigorous firms.

Towards the end of the war it was predicted that the tranquil trading conditions would not last and competitive conditions were in fact speedily restored. The multiples got off to a quick start. Already in February 1919 the leading multiples were chasing down the prices of staples like margarine and bacon; and the firm of Sainsbury advertised that it would reduce the price of tea by fourpence per pound as soon as controls were removed. In the following month another multiple firm, Maypole Dairies, decided to keep its shops open longer and later by means of shift-working. Many of the smaller-scale grocers refused to be passive followers of the price decisions of the multiples; there is evidence of price-cutting introduced independently by ordinary members of the trade. In some towns price-cutting of proprietary articles, in particular, was stimulated by " the street trader, with his barrow loaded with proprietary goods " who sold at low prices and forced other grocers to follow suit.[1]

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[1] Proposals for placing legislative restrictions on the conversion of houses into shops and on speculative building of shops were among the early suggestions for curbing "irregular" traders and the growth in the number of shops. (See, for example, editorial, *G.*, 6.3.1909, p. 709.)

[2] See Yamey, *op. cit.*, ch. 8.

[3] Price competition did not cease completely even in the sale of controlled goods. For examples of price-cutting, see *G.*, 27.2.1915, p. 561; 16.10.1915, p. 938; 15.7.1916, p. 129; and 20.4.1918, p. 538.

Price competition in the sale of both branded goods and staple lines continued throughout the inter-war years, though there were variations in its intensity.[2] The multiples were a major force, and a good deal of antagonism towards them was evident in legitimate trade circles.[3] Some of the variety chains also added to the competitiveness of the market by embarking on the sale of groceries.[4] But the main innovation of the 1930's was the appearance of the so-called cut-price grocery shops in the larger cities and towns. Even the well established multiples felt the impact of this new competition, and several of the larger firms joined in the widespread protests against the policies and activities of the cut-price traders. Some multiples had increased their services to customers in the inter-war years and this may have assisted the cut-price shops which provided very little service and concentrated on low prices.

The first of the cut-price shops, which turned to their own advantage the term ' cut price ' which had been used to disparage them, seem to have come into operation in 1930, and by the beginning of 1932 they were attracting much custom and attention. Their numbers were increasing and they were spreading from London to the provinces. At first most of the shops were in unattractive premises and in a small way of business; but quite soon their appearance and methods improved, and syndicates were established which conducted large-scale operations. Many cut-price traders worked on a cash-and-carry basis, and tended to concentrate on the sale of branded goods. They could handle these goods even if they had little or no previous experience of the grocery and provision trade, and they also could use relatively inexperienced labour, including that of women and juveniles.[1]

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[1] Editorial, *G.*, 19.8.1922, p. 51.

[2] Thus there appears to have been a short-lived cessation of severe price competition about the end of 1930 and the beginning of 1931. (See, for example, editorial, *G.*, 28.2.1931, p. 66.)

[3] However, trade sentiment was mixed. The Grocers' Federation by this time included among its members firms which were already small or medium-sized multiples and others which hoped to become multiples. Thus in 1936, the Federation did not support the unsuccessful Shops (Retail Trading Safeguards) Bill, which aimed, *inter alia*, at restricting the growth of multiples. Although it sympathised with the main object of the Bill (a privately introduced measure), the Federation disapproved of some of its provisions and thought it would " limit the scope of independent private enterprise traders ".

This was one of several matters affecting the regulation of competition on which there were divisions of interests in the ranks of the organised trade; this contributed to the general ineffectiveness of trade efforts to control competition.

[4] The extension of the operations of variety chain stores into the grocery trade provoked a strong reaction when in 1928 certain well known manufacturing firms supplied special packs of their goods to a leading variety chain. One firm announced that it had " decided to bow to the storm " and was " informing the [multiple] firm in question that we shall be unable to fulfil further orders ". Others announced in trade advertisements that they did not supply " others than legitimate traders in the grocery and dairy business ". (By this time the dairies, which had been regarded as interlopers in the grocery trade before 1914, were considered to be in and of the trade. Some of the dairy companies had added more grocery lines to their trade after the First World War.)

The cut-price stores lived up to their name by cutting the prices of the bulk of the goods they sold and in particular they made serious inroads into the trade in branded goods of legitimate grocers. Many housewives were attracted by the low price of the goods on sale even though services were curtailed and the shoppers could not always buy all their grocery and provision requirements in one shop.[2] The basic methods of the ' cut-price ' shops—limitation of service and limitation of range of merchandise—closely resembled those of the larger multiples particularly in their early years; the reaction of many consumers was much the same in the two cases, though general economic conditions in the two periods were quite different.

The cut-price traders and others seem to have had little difficulty in obtaining supplies of many brands which were nominally price-maintained even though they sold them at less than the stipulated prices. Important brands or classes of branded goods were subject to retail price-cutting because their manufacturers were either unwilling or unable to put an end to it. For example, it seems that in the inter-war period (or the major part of it) many of the leading brands of soap, sugar (in packets), breakfast cereals, canned fruit and vegetables, canned salmon, biscuits, polishes and chocolates either were not price-maintained, or if nominally price-maintained, were frequently resold below list prices.[3] On the whole price maintenance was neither sufficiently widespread nor sufficiently effectively enforced seriously to impede or to modify competition in the retailing of branded groceries despite the attempts made by the Grocers' Federation to persuade manufacturers to practise price protection.[1]

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[1] It was a common theme in the 1930's to link price-cutting with the payment of low wages and the employment of female and juvenile labour. Part of the success of the cut-price shops and of other price-cutting retailers was frequently ascribed both by large-scale and small-scale retailers to these factors, principally to the payment of low wages. However, it is doubtful whether they provide the main explanation of their success and growth. The price-cutters were not the only grocers to pay wages lower than those paid, for example, by some of the multiples, or to employ female or juvenile labour. Nevertheless, it is likely that the cut-price shops were better able than many of their competitors to use the cheaper grades of labour. They provided little retail service and their selling operations were simplified. Moreover, unlike the large multiple firms, the cut-price firms did not have to work within the framework of more or less rigid schemes of wage-rates. Trade union organisation was also much weaker among the employees of the smaller firms. [In 1937, 43 members of the Association of Multiple Shop Proprietors (Grocery and Provisions) entered into a wage agreement with the National Amalgamated Union of Shop Assistants, Warehousemen and Clerks.]

Organisations of grocers and the organised distributive workers generally believed that minimum wage legislation applicable throughout the trade would mitigate the severity of price competition. This was an important reason, but not the only one, why the trade took an active part in furthering schemes for the regulation of wages, hours and conditions of employment. But though the problem of compulsory minimum wage regulation in the distributive trades was officially explored from 1936 onwards with the help of trade associations and trade unions no official action was taken up to the outbreak of the Second World War.

[2] Thus in the early 1930's a Portsmouth grocer remarked that " he did a family trade chiefly, but he noticed that the cut lines were gradually disappearing from the order ", and the chairman of Northampton's Anti-Price Cutting Committee said that grocers had only to dissect their weekly orders to see where the cutters were getting their custom from.

[3] In addition, the gross margins on some important price-maintained brands were reduced in the 1930's. For example, in the second half of 1936 the margins of two

The severe cutting of the prices of branded goods coincided with keen competition in the retailing of staples. In the early 1930's the contraction of trade stimulated price competition, for " since prices and turnover began to decline, many retail grocers and provision dealers, realising that their heavy overhead charges remain stable, have had recourse to price-cutting in the hope, usually vain, that they would thereby maintain their takings ".[2] However, depressed trade does not appear to have been the major force making for price competition, for this persisted even when trade improved later in the 1930's.[3]

Many attempts were made to curb competition in the sale of sugar, a leading staple. From 1927 onwards the London Retail Sugar Association, revived on the initiative of the Greater London Council of Grocers' Associations, attempted by means of arduous negotiations to moderate competition in the sale of sugar. It enjoyed the support of multiples as well as the co-operative societies and it was reasonably successful between 1930 and 1933; then, though its aims were modest, it " failed to hold the trade together for any length of time at an economic profit " and collapsed during 1935. It regained a limited measure

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well known brands of tea were reduced from 8⅓ per cent. to 7½ per cent., and a year later to 6⅘ per cent. London grocers were urged by the Greater London Council of Grocers' Associations to lend their support to other brands offering a margin of 8⅓ per cent.

[1] These attempts are reviewed in Yamey, *op. cit.*, pp. 166–176.

The activities of the Grocers' Federation to promote price maintenance were sometimes backed up or extended by local efforts. Towards the end of 1933 when price-cutting of branded goods was rampant the Northampton and District Grocers' Association recommended a programme of action to be taken against unco-operative manufacturers, which was endorsed by at least another 35 local associations. The Northampton efforts failed, though similar activities were more fruitful in some other areas, at least for short periods. For example, in Hull the local association succeeded in securing the support of important local manufacturers who withheld supplies from cutters in the town and price-cutting abated. Hull was said to be fortunate " as it enjoyed a measure of comparative isolation, in the distance which separated it from other large towns ". However, after a few months London wholesalers upset these plans by supplying the cutters.

[2] Editorial, *G.*, 28.3.1931, p. 69.

Despite poor trade, new firms were attracted into the grocery trade; see, for example, *G.*, 16.9.1933, p. 113, which refers to such developments in the Isle of Thanet.

[3] Thus for the period 1936–1937 a leading multiple reported that it had to sell " at a margin of profit even narrower than in the preceding year. If we take, for example, say, five of the leading commodities that we handle in vast quantities—tea, sugar, butter, cheese and lard—and we had been able to secure the same margins of profit that we were able to make in 1935, our profit would probably have been a record in our history ". The narrowing of margins took place in a period when trade was improving and when wholesale prices were tending upwards. Another firm reported that " nearly all the leading articles—sugar, flour, butter, eggs, lard, and sometimes cheese—are frequently sold at nearly cost price ".

of control during 1937. Schemes in other areas had the same kind of experience with occasional and temporary spells of success.[1]

The emphasis has so far been on the severity of price competition in the inter-war years. However, as would be expected, price-cutting was not strong everywhere. Many of the smaller towns and villages were without multiples,[2] and cut-price shops congregated in the larger cities and towns only. Gentlemen's agreements on prices were more likely to be observed in the smaller towns than elsewhere.[3] Grocers who were fortunately placed beyond the reach of the more strenuous competitors were often told not to publicise their good fortune lest it should attract the interest of the cutters. But even without such advertisement the multiples were spreading their activities in the inter-war years,[4] and the improvement in public transport and the operation of mobile shops led to more vigorous competition.

COMMENT

With the two exceptions of the decade before the "co-operative revolution" and the years of the First World War, price competition was generally widespread and pronounced in the retailing of groceries and provisions during the ninety years surveyed in this article. It was present in significant measure both in periods of good trade and employment and in periods of declining trade and substantial unemployment; it accompanied rising as well as falling wholesale prices, and affected the sale of unbranded as well as of branded goods. The price competition varied in intensity. It was more severe in the cities and larger towns than elsewhere, but its influence became progressively more pervasive. It reached its greatest intensity in the years from about 1890 to 1914 and, again, from about 1931 to 1939. Over the years many

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[1] The Retail Sugar Association of London reported the annual average rate of gross margin on granulated sugar, and it is possible to trace fluctuations in its achievements. The figures are approximations, since they are based on its recommended prices, which were rarely fully effective; at times sugar was sold below the recommended prices throughout entire suburbs. The margins may be compared with the 14 per cent. or 15 per cent. authorised by the Food Controller in the First World War:

1927 ..	7%	1931 ..	14½%	1935 ..	4¼%
1928 ..	8½%	1932 ..	12¾%	1936 (3 months)	2½%
1929 ..	7½%	1933 ..	12¼%	1937 ..	10%
1930 ..	12%	1934 ..	9¾%	1938 ..	12%

[2] Thus, in a discussion in 1938 of price-fixing, country members of the Spalding and District Grocers' Association criticised the low prices suggested by town members. One of the latter pointed out that there were "many difficulties peculiar to the town". He recognised the favoured position of country members by saying that "there is not a 'Maypole' on every village green".

[3] Even then there were difficulties. For example, the secretary of the Grocers' Association in Wisbech recalled in 1929 that it used to be the "recognised thing" for three firms to take the lead in setting the prices of butter and eggs. "Most of the shops used to inquire of these firms the price of butter and eggs, and adopt theirs". After one of the three firms had closed down "they seemed to be at sixes and sevens". It was then decided to experiment with a system of price announcements in a local newspaper.

[4] A few of the larger firms deliberately followed a policy of reducing the number of their branches.

customers from all classes were attracted by price reductions, and attempts by retailers to substitute better services for less competitive prices were not successful to any appreciable extent in the aggregate though profitable in some individual cases.

There were several sources or causes of price competition operating during the period or parts of it; it would be difficult to incorporate the relevant factors in theoretical models of the traditional kind. The competition can be explained very largely in terms of the establishment of new firms, the development of new methods of retailing and new types of retail undertaking, and the presence of significant differences in the market situations of competing firms (e.g., in respect of efficiency, age and size of firm, range of merchandise, range of retail services, buying prices of merchandise and cost of labour inputs) and in the attitudes of their owners (e.g., in their objectives and aspirations, vigour in competition, and expectations and assessments of the market). The differences in the situations, attitudes and ambitions of competitors made it difficult, in turn, for firms to proscribe or curb price competition by formal or tacit agreement among themselves; in most areas the large number of firms and the ease of entry of new firms made voluntary restraints on competition ineffective even if, as was rare, there was substantial identity of interests among the established firms. Organisation to control competition, or to persuade suppliers to control it, was largely ineffective. It was difficult to organise a large and scattered trade, and at all times since the beginnings of trade organisation there were many firms—retailers, wholesalers and manufacturers—which favoured the continuation of competition in grocery retailing. Moreover, on several important issues there were serious divisions of interest even within the ranks of the organised part of the trade.

It does not follow that the forces which promoted price competition and obstructed attempts at its control in the period under review will necessarily continue in the future. Already some changes have become apparent, though their importance cannot yet be assessed with certainty. Thus the ease of entry into grocery retailing in some places has been curtailed by town planning restrictions, and the growth of successful firms, particularly the small and medium-sized firms, has been made more difficult by high taxation. Minimum wage regulation now applies throughout the trade; this may weaken the position of small firms employing some labour while improving the position of others employing no hired labour at all. It is also possible that resale price maintenance is now more widespread and better enforced than before the war. It has been argued by people in the trade that since the end of the war one form of innovation, self-service retailing, has been impeded by this practice, whereas, in our judgment, the practice previously was never sufficiently effective in the grocery trade to hamstring innovation.

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The Interaction of the Multiplier and Price Mechanisms

By A. Ll. Wright

Perhaps one of the most remarkable features of the development of the multiplier theory has been the complete neglect of price effects: as far as I am aware, only one model[1] has been constructed which embraces price effects. It has, indeed, been overlooked that Professor Kahn himself was very careful to emphasise that " the whole question [of the multiplier[2] effect] ultimately turns on the nature of the supply curve of consumption-goods "[3]; and he justified his neglect of price effects on the ground that " at times of intense depression, when nearly all industries have at their disposal a large surplus of plant and labour, the supply curve is likely to be very elastic ".[4] In other words, his analysis of the multiplier does not provide a *general* model, but only a *particular* model with an elastic supply of goods.[5] Keynes, too, brings in price effects, but only under the very heroic assumption " that there is perfectly elastic supply so long as there is unemployment, and perfectly inelastic supply so soon as full employment is reached ".[6] The aim of this article is to abandon the idea of a simple dichotomy between perfectly elastic and perfectly inelastic supply in a multiplier analysis, and to present a general model for any (and varying) values of the elasticity of supply.

Keynes has, of course, emphasised that consumption " is obviously much more a function of (in some sense) *real* income than of money income ".[7] The usual sense in which this is interpreted is to relate consumption to income when both variables are expressed in real terms by the application of a (theoretical) price-index deflator. Alexander adopts this method in his model by assuming that " price changes do not affect either real consumption expenditure or real investment expenditure; and that the latter only depend on the level of real income or on changes in that level ".[8] Consequently, and Alexander emphasises this point,[9] the consumption-function (or multiplier) is entirely *independent* of price changes. Is this the sense in which consumption is to be related to real income? I do not think so. If price changes are introduced into the model, the consumption-function can no longer be left among the known data: it becomes a *variable*, in some way *dependent* upon price changes.

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[1] S. S. Alexander, " The Accelerator as a Generator of Steady Growth ", *Quarterly Journal of Economics*, LXIII, 1948–49, pp. 174–97 and *idem*, " Mr. Harrod's Dynamic Model ", *Economic Journal*, LX, 1950, pp. 724–39.

[2] Professor Kahn himself never used the term " multiplier "; he adopted the term " ratio " instead. The ratio in question was that of *secondary* employment to primary employment (see R. F. Kahn, " The Relation of Home Investment to Unemployment ", *Economic Journal*, XLI, 1931, p. 183) not of *total* additional employment to primary employment, as Keynes would seem to imply: see J. M. Keynes, *The General Theory of Employment, Interest and Money*, London, 1936, p. 115.

[3] R. F. Kahn, *loc. cit.*, p. 182.

[4] *Ibid.*, p. 182.

[5] He did, however, incidentally analyse the position for some particular price changes: see *ibid.*, Section XII, pp. 186–7.

[6] J. M. Keynes, *op. cit.*, p. 295.

[7] *Ibid.*, p. 91; italics in original.

[8] S. S. Alexander, *loc. cit.*, *Quarterly Journal of Economics*, LXIII, 1948–49, p. 189.

[9] See *ibid.*, p. 189.

To avoid the difficulties involved in constructing a matrix multiplier to handle a micro-economic model, the problem will be approached here from a macro-economic point of view. Total expenditure (on consumption-goods[1]) can be regarded as an entity which can be assumed to have an average price-level for any particular period. This average price-level is determined by the interaction of the demand curve for and the supply curve of total output in that period. In other words, price effects are felt instantaneously. But demand is also affected by the income of the previous period, if we introduce the usual single-period time-lag. Instead of the ordinary kind of approach, then, with a single demand curve, we have a family of demand curves for any period, one for each level of income of the previous period. Expenditure for any period is thus broken down into two components—an instantaneous price effect and a lagged income effect. On the other hand, assuming that technical conditions are given, we have only one supply curve, just as in the ordinary type of analysis.[2]

Instead of following the usual convention, however, and plotting prices against *quantities*, prices can be plotted against *expenditures*, i.e., the products of price and quantity. The ordinary demand curve is then replaced by what may be called an *expenditure curve*. These expenditure curves can be drawn for various *constant* values of the elasticity of demand. If the elasticity of demand is unity[3] the expenditure curve is a straight line parallel to the price axis—no matter what the price, expenditure is constant. On the other hand, if the elasticity of demand is infinite, the expenditure curve is a straight line parallel to the expenditure axis—the price must be constant for any expenditure to take place. An expenditure curve with a zero elasticity of demand is also a straight line, making a positive angle[4] with the expenditure axis the magnitude of which depends on given conditions. If the elasticity of demand lies between zero and unity, i.e., the cases of inelastic demand, the slope of the expenditure curve is positive with respect to the expenditure axis and the curve is convex to this axis—increasing prices are accompanied by increasing expenditures but at decreasing rates. Finally, if the elasticity of demand is greater than unity, i.e., if demand is elastic, the expenditure curve is again convex to the expenditure axis but with a negative slope—rising prices are accompanied by decreasing expenditures at a decreasing rate.

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[1] Cf.: O. Lange, "The Theory of the Multiplier", *Econometrica*, XI, 1943, p. 231; and A. Smithies, "Keynesian Economics: The Propensity to Consume and the Multiplier—The Multiplier," *American Economic Review*, XXXVIII (May, 1948), p. 300 (Papers and Proceedings).

[2] A criticism, of course, can be raised here. Can an ordinary price-quantity demand curve be drawn for output *as a whole?* There is no *a priori* reason why it cannot be so drawn: Kahn himself, in fact, did just this when he mentioned price changes. Price changes take place in one period, and the effect of such changes on income is not felt until the *next* period; so that a price effect, quite distinct from an income effect, is present. A more realistic, and more satisfying, model could only be constructed by means of a matrix. However, the aim of this analysis is not to present a comprehensive multiplier model with any finality, but only to advance beyond those types of model which present analyses (generally implicitly) in real terms. At any rate, it is only on an analysis which splits the consumption-function into two components, an income effect *and* a price effect, that a micro-economic model accounting for prices can be based.

[3] In the text we follow Marshallian convention in regarding the elasticity of demand as a positive coefficient.

[4] The equation of the expenditure curve is $E=ap^{(1-\epsilon)}$, where E is expenditure, p the price-level and ϵ the constant elasticity of demand.

As in the case of the expenditure curve, so in the case of what may be termed the *total supply curve*, a relation between expenditure and price can be established on the supply side, and total supply curves with constant elasticities can be drawn.[1] If the elasticity of supply is infinite, prices are constant for every amount of expenditure, and the total supply curve is a straight line parallel to the expenditure axis. On the other hand, since the elasticity of supply is positive (and not merely conventionally so as is the elasticity of demand) the total supply curve for a constant elasticity of supply of minus unity is a straight line parallel to the price axis—a constant expenditure results in rising prices. If the elasticity of supply lies between minus unity and infinity, the slope of the total supply curve with respect to the expenditure axis is positive—increasing expenditure results in rising prices: in such cases we have an inelastic supply. But if the elasticity of supply is less than minus unity, the total supply curve is negatively sloped with respect to the expenditure axis—increasing expenditure results in falling prices: in this case supply may be said to be elastic.[2]

By combining the expenditure and the total supply curves in one diagram a position of equilibrium can be shown. In the equilibrium position the values of expenditure and the price-level are known: consequently, a point is determined on the diagram. Through this point a total supply curve can be drawn, the elasticity of which is known. Similarly, an expenditure curve with a given elasticity of demand can be drawn, and if the position is one of equilibrium this curve must be the one appropriate to this level of income or expenditure.

The mechanism of a multiplier expansion interacting with price changes can now be examined. Let us first consider the case where the elasticity of supply is infinite, and the elasticity of demand can take any value. The initial position of equilibrium is determined where the total supply curve, *tsc*, cuts any one of the three expenditure curves, e', e'', or e''', at Y_0, as in Figure 1, where price is measured along the ordinate and expenditure along the abscissa. The price-level is Op_1, and must obviously be constant at this value so long as the elasticity of supply remains infinite, while the total expenditure (and income) is

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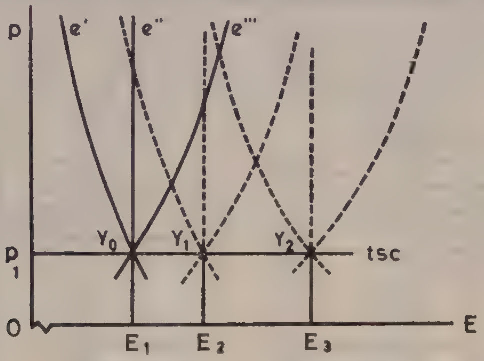
[1] The equation of the total supply curve is $p = \beta E^{\left(\frac{1}{1-\eta}\right)}$, where η is the constant elasticity of supply.

[2] If the elasticity of supply lies between zero and minus unity the total supply curve is convex to the expenditure axis: if it lies between infinity and zero it is concave.

OE_1. Suppose now that income is exogenously increased in period 1. In period 2 the expenditure curves, for any value of the elasticity of demand, all shift to a new position, Y_1, further away from the price axis, showing the expenditure of period 2 at OE_2. Now the shift of each of the expenditure curves must be horizontally equal at the level of Op_1, since this is the price-level of the original equilibrium position. But since this shift is due entirely to the income effect, and since the total supply curve is parallel to the expenditure axis at this level, it is obvious that the effect coming from prices on the expansion of expenditure in period 2 is nil. Now in period 2 income has increased by the sum of two amounts: firstly there is the increased expenditure in the period, equal to $OE_2 - OE_1 = E_1E_2$; and, secondly, there is the repetition of the exogenous injection. The sum of these two elements provides the increase in income which again shifts the relevant expenditure curve to Y_2: and by a process of argument identical to that adopted for analysing the changes in the second period the increase in expenditure in period 3 can be shown to be composed solely of an income effect, while the effect of prices is nil. *As long as the elasticity of supply remains infinite* this process of expansion will continue indefinitely from period to period. Given a constant shift factor, the expansion will be damped if E_1E_2 is less than the original exogenous injection of income, and explosive if greater. This is the simplest case of a multiplier expansion, and it is easy to see that it coincides with the usual type of analysis in which prices are either ignored or are (implicitly) assumed to remain constant.



MULTIPLIER EXPANSION
Infinite Elasticity of Supply
Figure 1[1]

We can now consider the case when the elasticity of demand is unity, so that the expenditure curve is now a straight line parallel to the price axis. Let us assume that the elasticity of supply is no longer infinite, but, in the first instance, positive, so that for increasing expenditures the price-level is rising. The total supply curve, *tsc'*, in Figure 2A is then upward-sloping. In the initial position of equilibrium, Y_0, the price-level is Op_1 while total expenditure is OE_1. Income is now exogenously increased in period 1, and the expenditure curve shifts from the e_1 position to e_2. As in the case when the elasticity of supply is infinite, the effect of prices *on expenditure* is nil. No matter what shape the total supply curve takes, so long as the second expenditure curve is parallel to the first, i.e., so long as the elasticity of demand remains unity, the expenditure in period 2 is solely determined by the *shift* of the expenditure curve, i.e., by the income effect. Consequently, provided the elasticity of demand remains unity, and even if the elasticity of supply lies between zero and minus unity, as the curve *tsc''* in Figure 2A, or if supply is elastic, so that increasing expenditures bring about reduced prices, as in Figure 2B, the sole effect exerted on expenditure is the income effect. So far as expenditure is concerned, the case is identical to that when the elasticity of supply is infinite. But there is this important difference. If supply is inelastic prices are rising: this can be easily seen in Figure 2A, where the price-level in period 2 is either Op_2 or Op'_2, which is greater than Op_1. On the other hand, when supply is elastic, the price-level is falling: in Figure 2B the price-level for period 2 is Op_2 which is less than Op_1. It can be seen, then, that so long as the elasticity of demand remains unity and the income effect remains constant, the multiplier series so set up is identical with the conventional type of multiplier series—being damped if E_1E_2 is less than the original exogenous injection, explosive if greater—with this important difference that the price-level is rising when supply is inelastic and falling when it is elastic.

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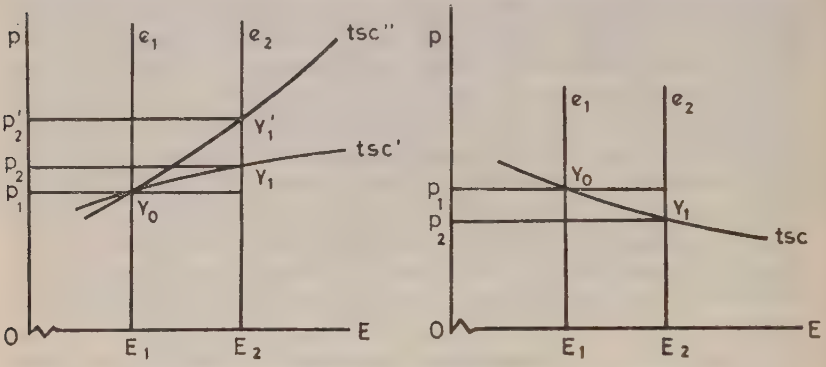
[1] The unit of measurement for price is double the unit of measurement for expenditure in all the Figures.

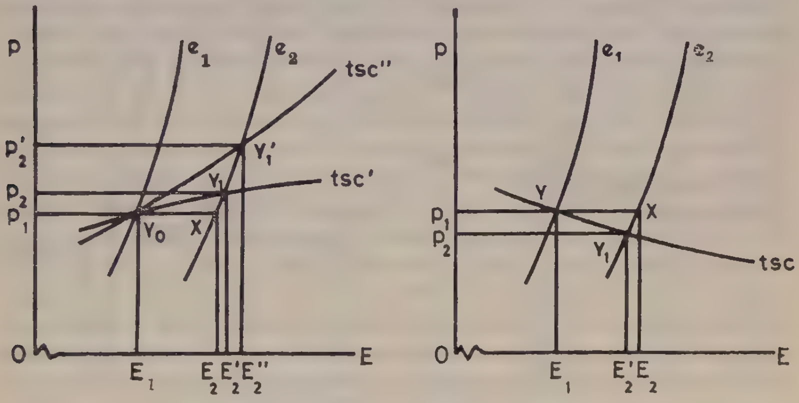


MULTIPLIER EXPANSION: UNIT ELASTICITY OF DEMAND

Inelastic Supply
Figure 2A

Elastic Supply
Figure 2B

We now turn to the case when demand is inelastic, so that, *cet. par.*, a rising price-level brings about increasing expenditures. Let us first of all assume that supply is inelastic, as in Figure 3A. Starting from an original equilibrium position in period 1, Y_0, where the price-level is Op_1 and expenditure OE_1, with an exogenous injection of income in this period, the expenditure curve is shifted from e_1 to e_2 by the income effect through Y_0X. The income effect is therefore equal to E_1E_2. But the second expenditure curve cuts the total supply curve for a positive elasticity of supply, *tsc*′, at Y_1, which must, since both the expenditure and total supply curves have positive slopes, be further away from the price axis than X. Consequently, expenditure during the second period is OE'_2. The price effect, as it may be termed, $E_2E'_2$, is positive, and thus *increases* the total multiplier effect. At the same time, prices have risen from Op_1 to Op_2. If, however, the elasticity of supply lies between zero and minus unity, the total supply curve, *tsc*″ in Figure 3A, is convex to the expenditure axis; consequently, the expenditure in period 2 will be even greater than in the case when the elasticity of supply was merely positive, at OE''_2, while prices will rise even higher to Op'_2. Now since such a total supply curve is convex it may happen that with a small elasticity of demand the second expenditure curve may never cut the total supply curve, so that a highly unstable situation is set up.[1] The problem, however, is only mentioned here: as will be seen in a moment its emergence is virtually impossible. In other words, assuming that both the elasticities and the income shift are constant, an inelastic supply coupled to an inelastic demand makes for a greater expansion than occurs when price effects are neglected: the expansion will be damped if $E_1E'_2$ (or if $E_1E''_2$ when the elasticity of supply lies between zero and minus unity) is smaller than the original exogenous injection, explosive if greater.



MULTIPLIER EXPANSION: INELASTIC DEMAND

Inelastic Supply
Figure 3A

Elastic Supply
Figure 3B

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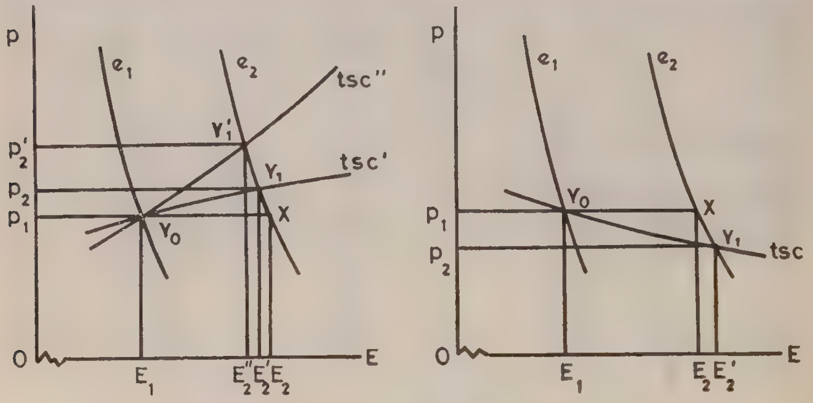
[1] The case actually occurs when the elasticity of demand equals the negative value of the elasticity of supply. Of course, with a positive value of the elasticity of supply a similar case of instability could occur, only then the elasticity of demand must become negative, and such a case can, therefore, be neglected as impossible.

On the other hand, if supply is elastic, as in Figure 3B, the total supply curve has a negative slope. Although the income effect is still the same as in the previous case, E_1E_2, the total multiplier effect is smaller. For, since the total supply curve has now a negative slope the expenditure curve has still a positive slope and the second expenditure curve must cut it at a point nearer to the price axis than X. The price effect, E'_2E_2, is thus negative, and the net multiplier effect is therefore smaller than a multiplier effect calculated on a neglect of price changes. It is also easy to see that in this case the price-level now falls, from Op_1 to Op_2.

Finally, the case where demand is elastic must be examined. In Figure 4A supply is inelastic while in Figure 4B it is elastic. It is easy to see that in the first case the price effect is negative and that this retarding effect is stronger in the case when the elasticity of supply lies between zero and minus unity than when it is greater than unity. Notice, too, that the greater (smaller) the elasticity of supply the smaller (greater) the slope of the total supply curve, and, consequently, the smaller (greater) the negative price effect and the greater (smaller) the net multiplier effect. In this case also prices are rising, and similar conclusions apply: the greater the elasticity of supply the less the price rise. In the second case, when supply is elastic, the price effect is positive and prices themselves are falling. Consequently, given a constantly (non-infinite) elastic demand and a constant income shift, rising prices resulting from a permanently inelastic supply decrease a multiplier expansion, while falling prices resulting from a permanently elastic supply increase the multiplier expansion. Whether the series so set up is damped or explosive depends on the same conditions as before.



Multiplier Expansion: Elastic Demand

Inelastic Supply
Figure 4A

Elastic Supply
Figure 4B

With an increase in the elasticity of demand the (negative) slope of the expenditure curve decreases so that the price effect is magnified. If, then, supply is inelastic, an increase in the elasticity of demand reduces the multiplier effect, while if supply is elastic the multiplier effect is increased. In the limit the elasticity of demand becomes infinite and the expenditure curve becomes a straight line parallel to the expenditure axis. Consequently, in this limiting case, whether supply is inelastic or elastic, the multiplier effect is reduced to zero since the expenditure curves for any two adjacent periods are coincident. An important corollary follows immediately: if the elasticity of demand is infinite no multiplier expansion can ever be set up—pump-priming will be abortive.

The argument so far has been virtually mechanical. Given the various *constant* values for both the elasticities and for the income shift, the results which have been briefly analysed must follow. It remains to discuss which values of these reaction coefficients are most reasonable to assume for a multiplier type of expansion. It is seldom expressly stated, but usually implied, in multiplier analysis, that the technical conditions of production are given. Now, in the analysis presented here, in so far as the relationship between the expansion of income in any period and in the next is constant, any of the above series can be summed indefinitely, just as in the conventional type of analysis. However, given an increasing money income with given technical conditions the elasticity of supply must be falling. Consequently, even if a multiplier expansion is started in a period of unemployment with an elastic supply, there must come a stage when the elasticity of supply becomes, firstly, infinite and then falls towards zero. It follows, too, that the highly unstable situation envisaged above when the value of the elasticity of supply lay between zero and minus one cannot occur, for such an explosive situation is bound to result immediately in a falling positive value of the elasticity of supply.

What implications has this for the demand side of the expansion? With falling values of the elasticity of supply the rise in the price-level is accelerated. If demand is inelastic the price effect itself will account for increasing expenditure: and this increasing expenditure must at some stage become greater than the exogenous injection of income itself, while it is at the same time an *addition* to the income effect. Consequently, the increasing expenditure cannot be entirely met from the continuous exogenous injection. If the economy is experiencing an inflation, of course, the increasing expenditure due solely to the price effect could be met from the increasing supply of money. In an inflationary situation, then (ignoring accelerator effects), a multiplier expansion, which need not necessarily be damped, could continue indefinitely. In the absence of inflation, however, the limit to expenditure from price effects must be set when the elasticity of demand has almost risen to unity. Now is there any reason to assume that the elasticity of demand can become *permanently* (so that the multiplier expansion can continue for an infinite length of time) stuck at such a value? Bearing in mind that it is extremely unlikely to fall much below unity, it follows that there is every possibility of it, at least sometimes, increasing above unity. But when this occurs, even although there are rising prices, the increase in income must be decreasing more sharply, for a negative price effect now makes itself felt. From what is known of general economic psychology, it would seem justifiable to assert that with rising prices and decreasing increases in income the elasticity of demand will *remain* above unity, and is, indeed, likely to go on increasing.

The implications of these variations for a multiplier series are obvious. Even with a *constant* income shift, the expansion will be subject to a *continuously increasing* damping factor, and the multiplier effect will be quickly reduced to negligible proportions and may well be completely wiped out if the elasticity of demand rises towards infinity. Such a rise is not so impossible as might at first sight appear. It must be emphasised that in this analysis, where the expenditure curve is related to money income, an infinite elasticity of demand does *not* imply that *no* expenditure at all takes place in the face of rising prices. The price rise in any period is caused by the *increased* expenditure in the same period, and, due to the income shift parameter, if demand is infinitely elastic this implies that no *increase* in expenditure will take place within the period. Now there is nothing at all improbable in supposing this condition to be fulfilled, more particularly when it is remembered that the increase in income is falling. There would seem, to be strong reasons, then, for supposing that multiplier effects do *not* continue into an indefinite future, but are arrested by rising prices after a definite time from the initiation of the expansion.[1]

This article has tried to combine the fundamental contributions of classical and Keynesian theoretical economics. The Keynesian theory provides the mechanism by which repeated exogenous impulses drive the system upward. The essential influence of rising price-levels is retarding—the classical system provides the forces which act in a gravitational manner pulling the system back to its original position. The development of this type of multiplier analysis can take place in two directions. In the first place, this analysis must be combined with an accelerator analysis, prices and the rate of interest playing their due part of course, to give some kind of theory of economic development and growth. In the second place, the assumption of a single price-level must be replaced by a theory of many different prices. In other words, the macro-economic model presented here must give way to a micro-economic (matrix) model.

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MATHEMATICAL APPENDIX

Let E_t be the expenditure on consumption-goods and p_t their price-level in period t, and let $Y_{(t-1)}$ be income, excluding the exogenous injection, in period $(t\text{–}1)$. Then the expenditure function can be written

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[1] Cf. J. M. Clark, " Capital Production and Consumer Taking; a Further Word ", *Journal of Political Economy*, XL, 1932, p. 693. Even, however, if these conclusions are thought to be unwarranted, this does not, in itself, invalidate the theory of the multiplier as an analytical tool put forward in this analysis. When coupled with a theory of the accelerator, for instance, *this particular* type of damping down problem is immediately avoided.

$$E_t = E(Y_{(t-1)}, p_t) \tag{1}$$

Whence

$$dE_t = \frac{\partial E_t}{\partial Y_{(t-1)}} dY_{(t-1)} + \frac{\partial E_t}{\partial p_t} dp_t \tag{2}$$

Now, where q_t is the quantity, or real volume, of expenditure for any period t,

$$\frac{\partial E_t}{\partial p_t} = \frac{\partial (q_t p_t)}{\partial p_t} = q_t + p_t \frac{\partial q_t}{\partial p_t} = q_t (1 + \epsilon_t) \tag{3}$$

where ϵ_t, the elasticity of demand for period t, is defined by the identity

$$\epsilon_t \equiv \frac{p_t}{q_t} \frac{\partial q_t}{\partial p_t} \tag{4}$$

The total supply function is given by

$$p_t = S(E_t) \tag{5}$$

Whence

$$dp_t = \frac{dp_t}{dE_t} dE_t \tag{6}$$

Now

$$\frac{dE_t}{dp_t} = \frac{d(q_t p_t)}{dp_t} = q_t + p_t \frac{dq_t}{dp_t} = q_t (1 + \eta_t) \tag{7}$$

where η_t, the elasticity of supply for period t, is defined by the identity

$$\eta_t \equiv \frac{p_t}{q_t} \frac{dq_t}{dp_t} \tag{8}$$

Consequently,

$$dp_t = \frac{1}{q_t (1 + \eta_t)} dE_t \tag{9}$$

Substituting equations (3) and (9) into equation (2), and writing the income reaction coefficient

$$e_t \equiv \frac{\partial E_t}{\partial Y_{(t-1)}} \tag{10}$$

equation (2) becomes

$$dE_t = e_t dY_{(t-1)} + \frac{1 + \epsilon_t}{1 + \eta_t} dE_t \tag{11}$$

It can be assumed that

$$1 - \frac{1 + \epsilon_t}{1 + \eta_t} \neq 0 \tag{12}$$

If this inequality does not hold the elasticity of supply must become algebraically equal to the elasticity of demand, a possibility which may be ignored since negative values of the elasticity of supply are ruled out.

It follows, then, that

$$dE_t = e_t \frac{1}{1 - \dfrac{1 + \epsilon_t}{1 + \eta_t}} dY_{(t-1)} \tag{13}$$

Further, making the assumption adopted in the text that the expenditure on consumption-goods in any one period is the income, excluding the exogenous injection, in the same period, $dE_t = dY_t$; therefore

$$dY_t = e_t \frac{1}{1 - \dfrac{1 + \epsilon_t}{1 + \eta_t}} dY_{(t-1)} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (14)$$

which can be more simply written as

$$dY_t = A_t dY_{(t-1)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (15)$$

Notice that if e_t has a constant value, e, and if the elasticity of supply is permanently infinite or if the elasticity of demand has a constant value of -1, then every A_t becomes equal to e and equation (15) becomes

$$dY_t = edY_{(t-1)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (16)$$

an equation identical with the familiar consumption-function equation. Again, if the elasticity of demand becomes negatively infinite A_t becomes zero.

Assume that income is exogenously increased by $\overline{Y}$ in period O. The expansion of income in period t due to this first exogenous injection is $A_1 A_2 \ldots A_t \overline{Y}$. The expansion of income in the same period due to the exogenous injection of income in period 2 is $A_2 A_3 \ldots A_t \overline{Y}$. And so on for the exogenous injections in each of the periods up to the $(t-1)$th. Consequently, the total increase of expenditure over its initial level in period O, say Y_t, i.e., the total addition to income up to period t exclusive of the exogenous shock in period t, is given by the sum of all these elements: that is

$$Y_t = \overline{Y}(A_1 A_2 \ldots A_t + A_2 A_3 \ldots A_t + \ldots + A_{(t-1)} A_t + A_t) \ldots\ldots \quad (17)$$

The multiplier expansion comes to an end at period n when $Y_{(n+k)}$, where k is any positive integer, equals Y_n. From equation (15) it can be seen that this occurs only when the $A_{(n+k)}$ are each zero: i.e., when the elasticity of demand becomes negatively infinite permanently. The value of the multiplier expansion is then given by equation (17) when n is substituted for t.

On the other hand, if the A coefficients are regarded as constant and less than unity (more rigorously, if this coefficient lies between -1 and $+1$, a damped cyclical expansion being set up in the case when it lies between 0 and -1) and if the original exogenous injection is also added in, the series of equation (17) can be summed to infinity to give

$$Y_{\propto} = \overline{Y}\frac{1}{1 - A} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (18)$$

This equation is, of course, the usual multiplier equation, where A is the marginal propensity to consume and $(1 - A)$ the marginal propensity to save.

The Purchasing Power of British Exports Further Considered

By D. J. Morgan and F. W. Paish

In his article " The Purchasing Power of British Exports " (*Economica*, February, 1955) Mr. R. L. Marris draws attention to the well-known historical fact that the volume of British exports tends to rise when the terms of trade become more adverse to the United Kingdom and to fall when they become more favourable. This relationship is shown and calculated with the aid of two charts. In the first chart the volume of merchandise exports for each of 29 years from 1920 to 1954 is plotted against the volume of imports that could be paid for each year out of that year's exports. The balance of trade is thus taken to be in regular equilibrium. The purchasable volume of imports is obtained by deflating the export volume for each year by that year's terms of trade index. The relationship is held to be linear, i.e. a constant amount of decrease in the terms of trade is associated with a unit increase in the volume of exports. In the estimating equation the terms of trade are taken as the dependent variable. In the next chart the volume of exports is plotted against the terms of trade indices for 19 years over the period 1920–52. The linear correlation coefficient is found to be 0·95 and the estimating equation suggests that the volume of exports could be predicted by subtracting 100 from twice the sum of the terms of trade index for the year in question. For the inter-war years the predicted volumes closely approximate the actual volumes while for the post-war years the margin of error is greater and a number of adjustments of either the actual volumes or the actual terms of trade indices is suggested.

On the basis of these calculations Mr. Marris urges a radical change in the United Kingdom's foreign trade policy and issues a challenge to those who support the policy of increased exports. Several detailed criticisms of the procedure followed by Mr. Marris might be advanced. Thus the appropriateness of the suggested adjustments for the post-war period, when the estimating equation was found less satisfactory, might be questioned. The absence of adjustments for the period after 1929 might be queried in view of the fact that the rapid growth of exchange and import controls would hardly permit the fulfilment of what is said to be " essentially an equilibrium demand relationship ". Again, Mr. Marris alleges that the historical data are innocent of changes due to a relative movement in the prices of United Kingdom manufactures and those of competitors in third markets, because such relative movements just did not take place after 1918. This view is quite contrary to the facts, as demonstrated by Sir Donald MacDougall in the section of his article, " Britain's Foreign Trade Problem " (*The Economic Journal*, March, 1947), concerning the price of exports and the value of the pound (pp. 102–110). At one place Sir Donald writes: ". . . it is surely significant that the depreciation of sterling in 1931, and the corresponding fall in our relative export prices, was accompanied by a sharp relative rise in our exports of manufactures; and that when in 1933 the United States in turn depreciated the dollar, and our relative export prices rose again to a new high level, our exports fell steadily again, in relation to those of the United States, up to the outbreak of war " (p. 103).

Such criticisms as these apart, the challenge might be answered either by a demonstration of generally high elasticities over the period since 1920 or by a more frontal attack on Mr. Marris's argument. The present writers feel that as all calculations of these elasticities must be accepted with the utmost reserve (see D. J. Morgan and W. J. Corlett, " The Influence of Price in International Trade: A Study in Method ", *The Journal of the Royal Statistical Society*, Series A, Vol. CXIV, Part III, 1951) there is very little point in any further calculations. We return, therefore, to Mr. Marris's article. To this there appears to be a fundamental objection. Mr. Marris seems to have been misled, possibly as the result of converting the terms of trade into the dependent variable, into committing the error of assuming that the association shown is evidence of a causative effect of one variable upon the other. Mr. Marris, in seeking an explanation of the undoubtedly close correlation between the volume of British exports and the terms of trade, interprets it as evidence that the terms of trade fluctuate as the result of changes in the volume of British exports. Hence his conclusion that the attempt to expand exports in order to be able to afford to buy more imports is self-frustrating, as the consequent worsening of the terms of trade will cancel out the effects of any increase in volume, leaving the country with little or no increase in its ability to pay for imports.

The traditional explanation of the relationship between the terms of trade and the volume of exports, to which Mr. Marris draws attention, is that, as the supply of primary products is inelastic in the short run, relatively small changes in supply and demand for these products in world markets induce large changes in their prices. Higher prices for primary products usually bring larger incomes for their producers, a favourable balance of payments for primary producing countries and, usually after a short time-lag, an increase in their imports; conversely, a fall in primary product prices usually brings an adverse balance of payments for primary producing countries and a decrease in their imports. As prices of manufactured goods, especially in the United Kingdom and increasingly in recent years, fluctuate less rapidly than prices of primary products, fluctuations in the value of imports of manufactured goods into primary producing countries take the form partly of fluctuations in volume. A large part of the United Kingdom's overseas trade being with primary producing countries, a rise in the value of their imports usually involves a rise in the volume of United Kingdom exports to them and, if more goods can either be produced or diverted from home consumption to export, in the total of United Kingdom exports. Conversely, when prices of primary products fall, the volume of United Kingdom exports to primary producing countries —and usually of the total of United Kingdom exports—falls with them.

How may these opposed explanations be put to the test ? If Mr. Marris's contention that changes in the United Kingdom's terms of trade have been caused mainly by changes in the volume of United Kingdom exports is accepted, we should expect to find that the changes in the terms of trade have been due mainly to changes in export prices, or, at least, to divergences of export prices from a trend shared by import prices. If, alternatively, the traditional explanation is accepted, we should expect to find that changes in the terms of trade have been due mainly to the fact that import prices fluctuate more sharply than do export prices. Let us see which of these explanations is best confirmed by the facts of recent history.

In Chart I we have set out changes not only in the terms of trade (i.e., the cost of imports in terms of exports) and the volume of exports, but also in import and export prices. The most cursory inspection of this chart reveals that, while the volume of exports certainly has a high positive correlation with the terms of trade, the price of imports has a high positive correlation with both. The price of exports, instead of having a negative correlation with the terms of trade and the volume of exports, as Mr. Marris's theory would seem to require, appears to have, if anything, a positive correlation with both.

The impression given by Chart I is confirmed by the more detailed examination of the figures made in Table I. Out of the twenty-seven yearly changes between 1919 and 1954 (1926 and the war years being excluded), import prices moved in the same direction as the terms of trade twenty times, as against five in the opposite direction, and eighteen times in the same direction as the volume of exports, as against seven in the opposite direction.[1] Meanwhile export prices moved in the opposite direction to the terms of trade only nine times, as against fourteen times in the same direction, and in the opposite direction to the volume of exports only nine times, as against fourteen times in the same direction.

If we take only the twelve years in which changes in the terms of trade exceeded 5 per cent. the evidence is equally conclusive. In ten of these years import prices moved in the same direction as both the terms of trade and the volume of exports, as against only two in the opposite direction, while export prices moved in the opposite direction to both only four times,[1] as against eight times in the same direction. Thus in most years, when the terms of trade changed, they did so in spite of, and not because of, changes in export prices, and in most years when the volume of exports rose or fell, it did so in spite of the fact that export prices rose or fell in the same years. That the volume of exports rises when export prices rise, and falls when export prices fall, is not explicable in terms of Mr. Marris's theory. It is intelligible only on the assumption that year-to-year changes in the volume of U.K. exports are generally due mainly to changes in the demand of overseas countries for imports from the United Kingdom, and not to changes in the pressure to force additional quantities of United Kingdom exports on to foreign markets[2]; and the fact that the volume of United Kingdom exports rises when British import prices rise, and falls when import prices fall, indicates that a major cause of a change in demand for imports by overseas countries is a change in the price at which they have been able to sell their own exports. Thus the result of examining changes in average annual import and export prices, rather than merely resultant changes in the terms of trade, appears strongly to support the traditional explanation of the correlation between the terms of trade and the volume of exports against the explanation now put forward by Mr. Marris.

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[1] These proportions are almost the same as those for the relationship between the terms of trade and the volume of exports, which moved in the same direction nineteen times and in opposite directions six times.

If further support is needed for these conclusions, it can be obtained by looking, not at annual averages, but at the quarterly averages which are available for post-war years. If we look at the figures for the past seven years, as shown in Chart II, it is impossible to doubt that it has been changes in import prices, and not in export volumes and export prices, which have been the determining factor in bringing about changes both in the terms of trade and in the demand for British exports, which in turn tend to bring changes in the volume of exports. Whether, in post-war conditions, it is the change in overseas demand which is also the main direct cause of the change in export prices is more doubtful; these are probably more immediately affected by the change in manufacturing costs caused directly and indirectly by the changed price of imports.

The London School of Economics.

[A Rejoinder by Mr. R. L. Marris will appear in the February 1956 issue of ECONOMICA.]

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[1] It may be noted that of these four years, two were before 1922, when prices of manufactured goods seem to have been more flexible than they became in later years, while in the other two (1937–38 and 1951–52) the discrepancy is clearly due to the fact that export prices followed import prices with a time lag.

[2] Additional selling pressure in the forms of improved publicity, more adequate provision for servicing, etc., would be reflected in an increase in foreign demand and, if anything, in an improvement rather than a worsening of the terms of trade.

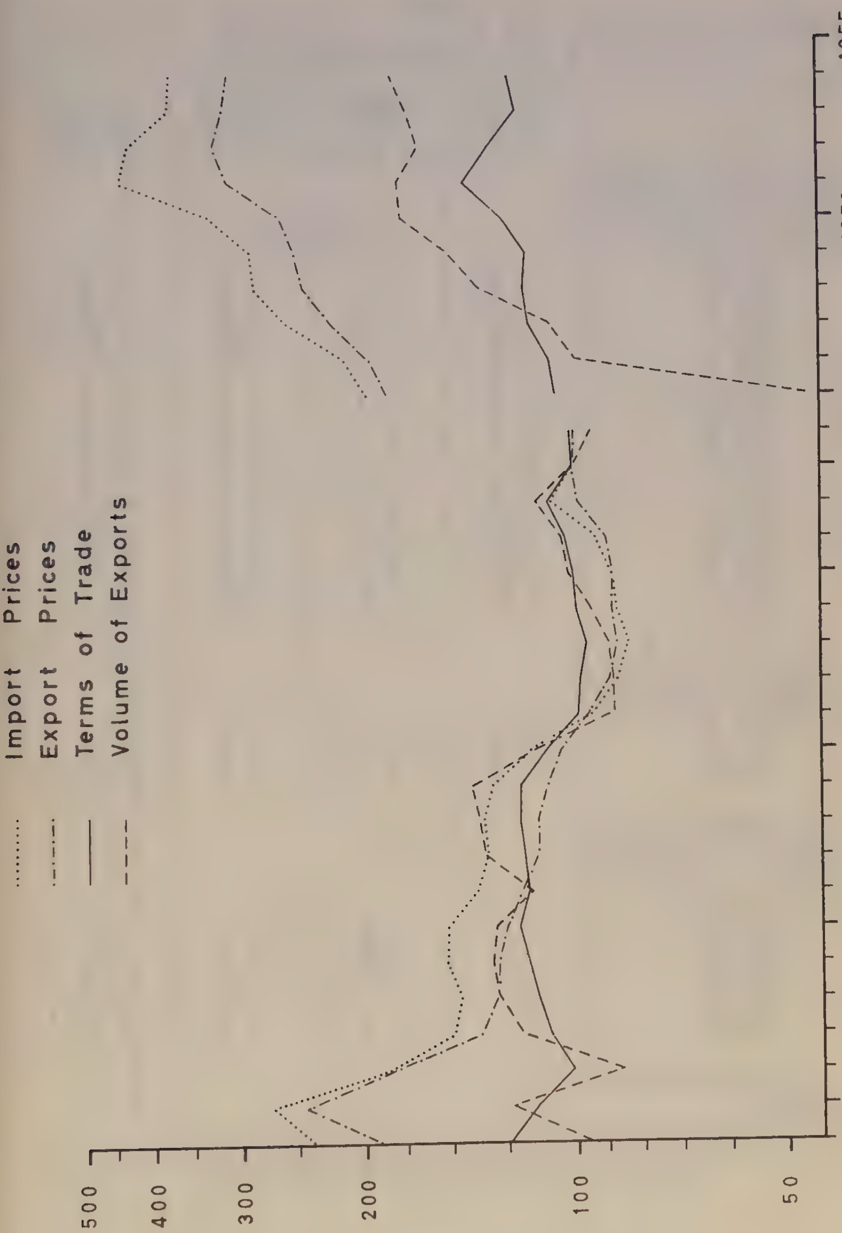
Import Prices
Export Prices
Terms of Trade
Volume of Exports
500
400
300
200
100
50
1920
1925
1930
1935
1938
1945
1950
1955

Chart 1

TABLE I

PERCENTAGE CHANGES FROM YEAR TO YEAR IN IMPORT PRICES, EXPORT PRICES, TERMS OF TRADE AND VOLUME OF EXPORTS

	Import Prices	Export Prices	Terms of Trade	Volume of Exports
1. Changes in Terms of Trade caused by greater changes in Import Prices than in Export Prices in the same direction.				
1920–21	−33	−25	−11	−30
1927–28	+2	—	+2	+2
1929–30	−12	−5	−8	−18
1930–31	−19	−10	−10	−23
1931–32	−7	−6	−1	—
1932–33	−3	−2	−2	+1
1933–34	+4	+1	+3	+7
1934–35	+1	—	+1	+7
1935–36	+6	+2	+3	+2
1936–37	+15	+9	+6	+9
1938–39	+1	—	+1	−6
1945–46	+8	+6	+2	+115
1946–47	+21	+13	+6	+10
1947–48	+12	+10	+2	+26
1949–50	+14	+5	+8	+16
1950–51	+33	+18	+13	+1
1952–53	−12	−3	−8	+3
2. Changes in Terms of Trade caused by opposing movements in Import and Export Prices.				
1923–24	+4	−1	+4	+2
1937–38	−7	+2	−8	−12
1951–52	−3	+5	−8	−6
3. Changes in Terms of Trade caused by greater changes in Export Prices than in Import Prices in the same direction.				
1919–20	+19	+30	−8	+29
1921–22	−20	−26	+8	+38
1922–23	−2	−5	+4	+8
1924–25	—	−2	+2	−2
1948–49	+1	+2	−1	+10
1953–54	−1	−2	+2	+6
4. Terms of Trade unchanged.				
1928–29	−2	−2	—	+3

Source: *London and Cambridge Economic Bulletin.*

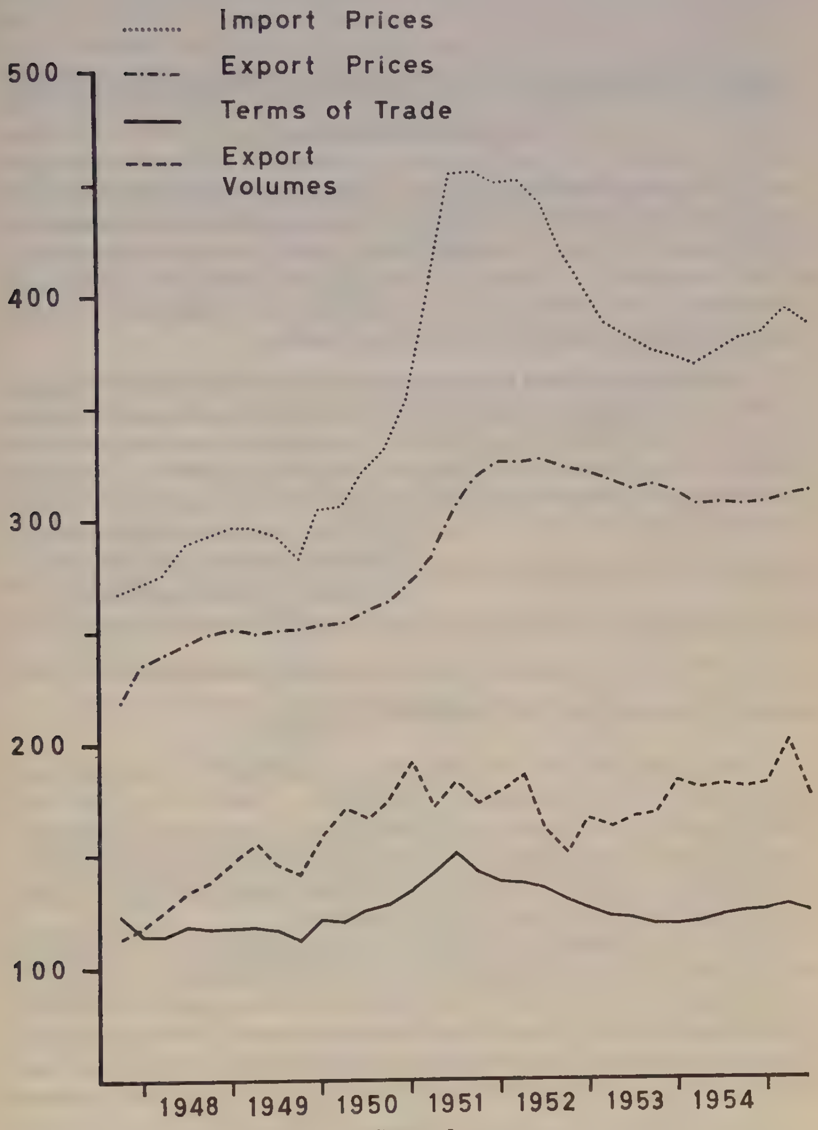
Import Prices
Export Prices
Terms of Trade
Export Volumes
500
400
300
200
100
1948
1949
1950
1951
1952
1953
1954

CHART 2

Factor Endowment and Relative Commodity Prices[1]

By T. M. Rybczynski

1. The purpose of this note is to investigate the effect of an increase in the quantity of a factor of production upon production, consumption and the terms of trade. Although in the model used here the quantity of only one factor is varied, the analysis can easily be extended to variations in the quantities of two factors—the variations in these factors being proportionate or disproportionate.

2. We assume a closed economy with only two factors of production, X and Y, which are perfectly divisible, perfectly mobile, and in some degree substitutable. There are but two industries and each of them is subject to a linear homogeneous production function. They are producing two commodities L and R. The " factor intensity " of each industry is different. By this we mean that technical conditions of production are such that the ratio $\frac{\text{marginal physical product of } X}{\text{marginal physical product of } Y}$ is always equalised as between the two industries by using a higher ratio of $\frac{X}{Y}$ in one of the industries (the X-intensive industry) and a lower ratio of $\frac{X}{Y}$ in the other (the Y-intensive industry).

3. We shall use the box diagram as employed by Stolper and Samuelson[2] to depict production conditions. Thus in Fig. 1 the box $ABCD$ depicts an economy with AB of Factor X and AD of Factor Y. Isoquants for the commodity L are shown by the family of curves convex to the origin A; similarly isoquants for the commodity K are shown by the family of curves convex to the origin C.

If we make commodity K X-intensive and commodity L Y-intensive, the contract curve AC must be convex to D. Equilibrium must lie somewhere on this curve. The position on the curve is determined by the condition that the substitution rate between L and K in production (as indicated by the isoquants) must be equal to the substitution rate in consumption (as indicated by the consumer preference system).

4. Suppose this condition is fulfilled at the point S. An increase in the quantity of Factor X may be shown by extending BA to BA'. The new production box is now $A'BCD'$. The horizontal extension

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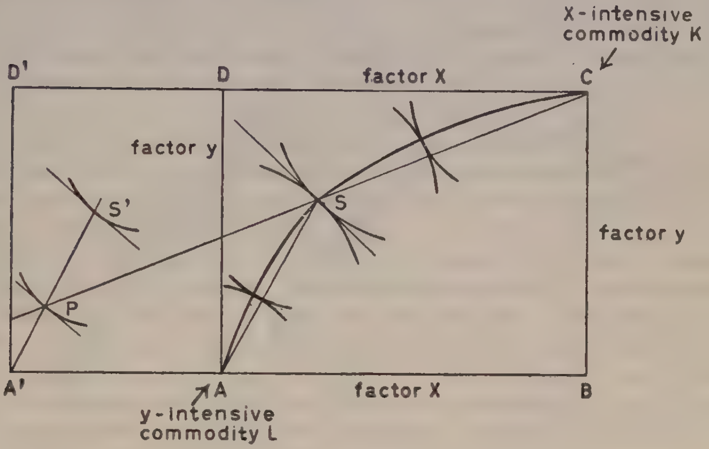
[1] I wish to express my thanks to Dr. H. Makower for valuable suggestions regarding the exposition of this paper.

[2] See W. F. Stolper and P. A. Samuelson, " Protection and Real Wages ", reprinted in *Readings in the Theory of International Trade*, pp. 347 *et seq.*

of the box leaves the family of the isoquants originating from *C* unaffected; the family of isoquants originating previously from *A* must now be shifted to the new origin *A′*. As the production functions of both commodities are homogeneous and of the first degree, the line *AS* intersects all members of the family of *L*-isoquants at points where their slopes are the same as at the point *S*; similarly *CS* intersects all members of the family of *K*-isoquants at points where these curves have this same slope. Therefore, when the line *A′S′* is drawn parallel to *AS* it must cut the family of isoquants originating from *A′* at points where these curves all have the same slope as the curves at *S*.

FIG 1



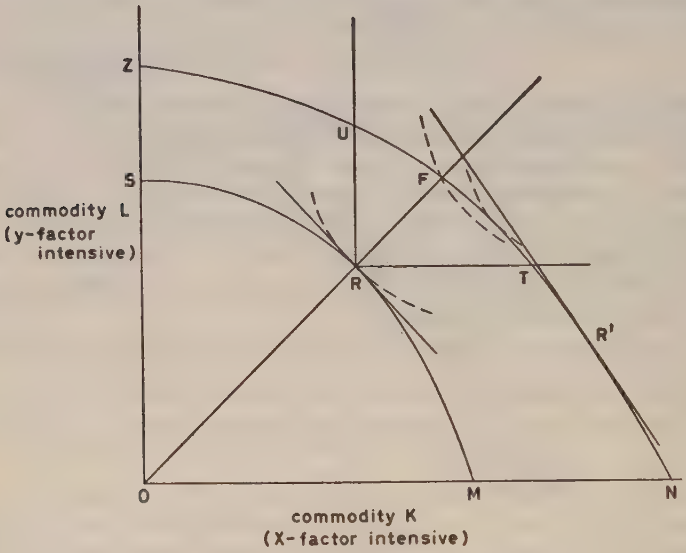
Let the line *CS* be prolonged to cut *A′S′* at *P*. Point *P* must be on the new " contract " curve because the slopes of the two isoquants passing through that point are by the above reasoning equal, both being the same as the slope of the tangent at *S*. If the same rates of substitution in production were to remain after Factor *X* had been increased by *AA′*, *P* would be the new point of equilibrium.

5. Because of the property of linearity of the two production functions, the amount of a commodity produced may be measured by the distance along any given radial from the origin. Thus since the length *A′P* is necessarily shorter than *AS*, production of the *Y*-intensive commodity must be less at *P* than at *S*. The fact that *CP* is longer than *CS* shows on the other hand that production on the *X*-intensive commodity is expanded. This proves *that the maintenance of the same rates of substitution in production after the quantity of one factor has increased must lead to an absolute expansion in production of the commodity using relatively much of that factor, and to an absolute*

curtailment of production of the commodity using relatively little of the same factor.

6. The above proposition may now be carried over into a diagram showing " production possibility " curves. Thus in Fig. 2 the horizontal and vertical co-ordinates measure quantities of commodities *K* and *L* respectively. With the given initial quantities of *X* and *Y*, the boundary of possible *L*, *K*, combinations, or the " production possibility " curve, is *SM*. The concavity of this curve to the origin connotes conditions of increasing rate of substitution on the production side.

FIG. 2.



7. The original position of equilibrium is defined by the equality of substitution rates in consumption and production and is represented graphically by the point of tangency between the " production possibility " curve and an indifference curve (point *R* in Fig. 2). To find the new point of production and consumption equilibrium when the quantity of Factor *X* is increased, it is necessary to discover the new point of tangency between the new " production possibility " curve and (another) indifference curve. This requires the derivation of the new " production possibility " curve and its analysis in relation to the indifference curve system. Each will be examined below.

8. Now in virtue of our proposition that the maintenance of the same substitution rate in production, after Factor *X* has increased, requires an absolute increase in the output of the *X*-intensive commodity, and an absolute reduction in the output of the *Y*-intensive commodity, it follows that the slope found at *R* on the production curve *SM* (Fig. 2) must, on the production curve *ZN*, lie below *RT* where less of *L* is produced. We shall suppose that it lies at R′.

9. So much for the shape of the new " production possibility " curve. What is its relationship to the system of indifference curves ? We assume the absence of any inferior good. This means that as income increases more of both commodities must be consumed. This in turn implies that for any indifference curve above that passing through R, the slope prevailing at *R* must be found on a sector of the higher indifference curve which lies within the quadrant *URT*. Let the indifference curve passing through *F* have at that point the same slope as at *R* where *F* is the point of intersection between *OR* prolonged and *ZN*. Then since the new " production possibility " curve above *R′* is flatter than at *R* and the indifference curve through *F* has the same slope as at *R*, it follows that the indifference curve passing through *F* must cut the new " production possibility " curve from above at that point. But it also follows that, since below *F* the indifference curves become flatter, there must be a point of tangency between a (higher) indifference curve and the " production possibility " curve below *F*, but above *R′*. At such a point the slope of the " production possibility " curve and indifference curve must be flatter than at *R*. This implies that the terms of trade of the *X*-intensive commodity have worsened as against the *Y*-intensive commodity, and proves the proposition that the terms of trade of the commodity using relatively much of the factor whose quantity has increased must deteriorate.

10. No reference has been made so far to the conditions of demand. The fact that the point *F* was assumed to fall on the straight line *OR* was equivalent to the assumption that the Marginal Propensity to Consume is equal to the Average Propensity to Consume (the latter falling over the whole range of the change in the position of equilibrium). The implications arising from the possibility of the former being different from the latter must now be examined.

When the Marginal Propensity to Consume the *X*-intensive good exceeds the Average Propensity to Consume, the income consumption curve will cut the new " production possibility " curve somewhere between *T* and *F*. Since it has been proved that the new point of equilibrium must always be below the point where an indifference curve with the same slope as at *R* (i.e. defined by the income consumption curve) intersects the new " production possibility " curve, it follows that the more the Marginal Propensity to Consume favours the commodity using relatively much of the factor whose quantity has been increased, the smaller is the worsening of the terms of trade of that commodity.

The reverse holds equally true: when the Marginal Propensity to Consume the good which uses a relatively low proportion of the increased factor exceeds the Average Propensity to Consume, an indifference curve with the same slope as at *R* will cut the new " production possibility " curve somewhere between *U* and *F*, signifying that the terms of trade have turned more against the commodity using relatively much of the increased factor. The greater is the difference between the Marginal and the Average Propensity to Consume, the greater will be the deterioration in the terms of trade for the commodity using relatively much of the increased factor.

11. Our conclusion is that an increase in the quantity of one factor will always lead to a worsening in the terms of trade, or the relative price, of the commodity using relatively much of that factor. The Marginal Propensity to Consume influences the degree of deterioration, but it can never reverse its direction.

12. Despite the change of the relative prices of the two commodities the patterns of production and consumption may remain unaltered, or change in favour of one good or the other. By the unchanged pattern of production and consumption we mean that the quantity of both products has increased proportionately ; a shift in the direction of one commodity signifies a greater than proportionate increase in production and consumption of that good combined with a less than proportionate rise of the other. The new equilibrium is determined again by the difference between the Marginal and the Average Propensity to Consume on the one hand and the shift of the production possibility curve; the latter in turn is determined by the proportion in which one factor has been increased and the technical production functions of the two commodities.

The unequivocal generalisation possible regarding the new production and consumption patterns is that they will change in the direction of the good using relatively much of the factor increased (i.e. the quantity of that good produced and consumed will increase more while that of the other will rise less than proportionately) if the Marginal Propensity to Consume the product using relatively much of the factor increased remains equal to, or is greater than, the Average Propensity to Consume. When the Marginal Propensity to Consume is less than the Average then the new production and consumption patterns may still change in favour of the commodity using much of the factor increased, or may remain unchanged or move in the direction of the other good; the ultimate outcome depends, in this case, on the numerical values assigned to the factors mentioned; it is possible, however, to offer tentative conclusions that the small excess of the Marginal over the Average Propensity to Consume in the direction of the good using little of the factor increased is still likely to shift the production and consumption patterns in favour of the other commodity; a moderate excess is likely to leave the production and consumption patterns unchanged, while a large difference may be expected to alter both production and consumption in favour of that good. All this is but a corollary of our previous proof.

13. If it is now assumed that the commodity using relatively much of the factor, the quantity of which had been increased, is an item of export, this means that external terms of trade will deteriorate; conversely, should the commodity be an import, the terms of trade must improve.

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On the Calculation of Tax Burdens[1]

By Alfred H. Conrad

Dr. A. R. Prest, in the last issue of this review, brought in a strong indictment against the methods and assumptions used in several recent attempts to estimate the redistributive effects of public finance.[2] He presented, approvingly, the expert testimony of Professor Edwin Cannan that enquiry into changes in the distribution of incomes before and after tax is " a will-o'-the-wisp ". Finally, he offered a method of approach reputedly innocent of the distortions and difficulties from which the indicted comparisons suffered. The present note is a defence of the will-o'-the-wisp. I propose to show that comparison of distributions before and after redistributive budgets is possible. Further, I will argue that the calculations which Dr. Prest has pronounced to be " killed stone dead " are, in fact, the first step in a method of analysis much richer and no more dangerous than the device he offered. I will, finally, examine again the assumptions which he judged to be untenable.

I

We are concerned with the effect of public budgets on the distribution of personal incomes. There are obvious first effects: some people are billed for heavier taxes than are others; some people receive transfer payments or use government hospitals while others do not. If this were all that was involved, if there were no shifting of taxes and no secondary effects from government spending, then the most primitive calculation would suffice, and the problems of methodology would be non-existent. But there is more involved than the apparent first effects. Taxation may change the schedules of supply and demand for factors and commodities. The expenditure on consumption by income receivers will be affected by their tax burdens or their gains from transfers and these effects will have reverberations on incomes throughout the system. Assuming for the moment that we can measure at least the first impact, can we find out anything about the reverberations? And, if we can predict what these " ultimate " effects of taxation upon incomes should be, how can we identify that part of any change in income from one period to another which is due to public budgets?

Professor Cannan evidently argued from the premise that it is nonsense to try to compare an actual income distribution with an hypothetical distribution which is prepared on the assumption that there are no taxes or government services. One is tempted to insert "irreproachable" before "premise", but the adjective concedes too much. It is not nonsense to try to measure the effect of government activity upon the level and distribution of private incomes. It is not even questionable that we do well to measure the relationship between the level and distribution of actual disposable income and the level and distribution which should maintain in the hypothetical world where the government provides its usual services but does not effect any direct transfers between income receivers. What we want is a comparison between the income pattern embodying all the effects of redistribution, on the one hand, and the pattern which would prevail if we had the government budget and all of its income-multiplier effects *except* those due to redistribution, on the other. Dr. Tibor Barna tried to approximate the latter case in his definition of the "neutral" distribution.[1] Dr. Prest correctly rejects Barna's treatment of this concept in practice and then falls back on the simple device of comparing the year-to-year changes in the income shares of each size-of-income group. He proposes to include (exclude ?) the price effects of indirect taxation by deflating the net incomes with retail price indices appropriate to each income group. But the measured change reflects the combined effects of government finance, private consumption and investment, technological and institutional changes—a bundle of determining variables too highly aggregated for fruitful analysis. Dr. Prest anticipates this argument by asking whether it is important to know anything more. Certainly without knowing more we cannot say what the government's contribution has been—whether, indeed, it may not have been frustrating its own avowed aims. We can easily postulate a situation in which technical or taste changes caused decreasing inequality while the government collected a regressive tax bill. Would Dr. Prest's analysis tell us anything more than that the tax structure should be continued in its regressive form or that, if we knew how, we should intensify its regressive aspects ? Without knowing more we cannot estimate the effect of the redistribution on the gross income level. This is a far from useless piece of information if, along with the aim of a more egalitarian distribution, the government is committed to promoting higher levels of economic activity.

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[1] I wish to thank Professors Carl Kaysen and Robert M. Solow for many helpful and suggestive criticisms of the first draft of this article.

[2] A. R. Prest, " Statistical Calculation of Tax Burdens ", *Economica*, August 1955.

It is central to Dr. Prest's argument that the calculation of tax burdens must be limited to situations with a fixed aggregate real income. The studies which he has criticised, without exception, operate within that limit. But that is not a necessary restriction and it is a misleading one. Few of us would be willing to argue that redistribution can be viewed as a series of direct transfers from one group of income receivers to another. Even if we could identify those transfers and measure them satisfactorily, we could not ignore the secondary effects of such a primary redistribution upon the level and distribution of aggregate income. Dr. Prest's alternative procedure drops the restraint of the given real income and compares the relative income shares after taxes and transfers in two or more years. A more direct attack on the problem of measuring redistribution is possible if we can approximate the level and distribution of incomes given the multiplier effect of the government budget *without* any net transfers.[1] This means that we must drop the real income limitation and be prepared to consider two distributions and two income levels, one hypothetical and one actual, for a single year and a given budget.

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[1] T. Barna, *Redistribution of Incomes through Public Finance in 1937* (Oxford, 1945), pp. 11, 24.

We can compute the effect of government budgetary surplus or deficit by using the familiar income multiplier equation. But this tool cannot account for a redistribution of income and the possible changes in the system's propensity to spend which result from income transfers. By disaggregating the multiplier it does become possible to take account of the effect of redistribution and to change the relative weights of the several sectors' propensities to spend in the average community propensity. The striking resemblance of the Leontief input-output system to the familiar aggregate multiplier model has been discussed elsewhere in several different contexts for both static and dynamic analysis.[2] The analysis proposed here is based on that analogy. We can describe the income of any sector in the economy, let us say income group *j*, as the sum of the expenditures which other

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[1] In a budget so restricted, the taxes paid by each income receiver would just equal the benefits, monetary and in kind, which he received from the government. In the first disposable income equation below, $T_j = 0$.

[2] This resemblance follows from the fact that both the Leontief solution and the Kahn-Keynes multiplier are the sums of convergent geometric series, i.e.

$$1 + a + a^2 + a^3 \ldots = 1/(1-a), \text{ or } (1-a)^{-1}.$$

In the Keynesian case, we have the original, autonomous expenditure to which is added that expenditure multiplied by the marginal propensity to consume, plus the amount spent out of that somewhat smaller term, and so on, in a dwindling series of induced expenditures the sum of which is larger than the original autonomous term by the factor of the multiplier, $(1-\frac{dc}{dy})^{-1}$. In the Leontief multiplier process there is a first round of direct requirements of materials and services to produce a given commodity, plus a second round of requirements to produce the first round, and so on. But there is no more need to compute the sum round by round in the input-output solution than there is in the Keynesian system: the inverse of the coefficient matrix, i.e. the result of the simultaneous solution of the balance equations, is used as a multiplier to give us at once the sum of the series of direct and indirect requirements. It should be noted, however, that the rounds do not follow one another in calendar time, as in the dynamical Keynesian models; at most, they may be interpreted as artificial time units for the iterative solutions. In the present adaptation of the Leontief system we use the consumption function very much as in the Keynesian theory. The only difference is that we have a column of a_{ij}, each appropriate to an income group's behaviour, where Keynes used a single, average function for the whole economy.

I will only mention two of the earliest studies which made use of this analogy and my own application of the system in a closed fiscal policy model. See R. M. Goodwin, " The Multiplier as Matrix ", *Economic Journal*, December 1949; J. S. Chipman, *The Theory of Intersectoral Money Flows and Income Formation*, Baltimore, 1951; A. H. Conrad, " Multiplier Effects of Redistributive Public Budgets ", *Review of Economics and Statistics*, May 1955.

sectors make in purchasing j's output plus (minus) the net gain (loss) it experiences in its financial relationship with the government. If incomes are identified by y, the propensity of sector i to spend on the services of sector j by a_{ij}, and the sector's net gain or loss from taxes and transfers (the initial impact) by T_j, then the disposable income of any sector j may be written as

$$y_j=\sum_i a_{ij}y_i+T_j.$$

In matrix form, if we write all the a_{ij} as (a) and the net redistributions as the column T, we have

$$y=(I-a)^{-1}T,$$

which bears a remarkable resemblance to the familiar Kahn-Keynes aggregated multiplier equation.

How shall we interpret this equation? The column of T's defines the net first impact of taxes and transfers. The sense of " first " is that the burden (or benefit) so defined does not include the secondary effects on income which result from changes in the level of consumption. The y's represent the sector income totals embodying the secondary effects or reverberations. This is a useful device, capable of many kinds of income analysis. In the present case, the weights of the sector propensities to consume are changed and the subsequent effects on purchases and, therefore, incomes are summed through the interrelationships in the system. It will not, however, answer questions about the secondary *price* effects without either more information or more extreme assumptions. It rests upon the assumptions made about the initial incidence of the taxes and benefits.

One obvious use of this system is to introduce a change in the tax structure and to compute the generated income change

$$\triangle y=(I-a)^{-1}\triangle T$$

from one period to the next. But this simple model cannot be used to analyse the neutral finance case. A budget without net transfers would have $T_j=0$ and solution of the system of equations would, therefore, be indeterminate of scale. It is not necessary, however, to restrict ourselves to such an artificial case. The government does not only operate a transfer mechanism. It provides goods and services and may be included in the system even in the zero-net-transfers case. This more realistic description of government activity makes a determinate solution of the neutral case possible, economically and mathematically.

Let us modify the disposable income equation by separating the tax and the benefit aspects of the first-impact transfer term, T_j. If we designate the tax *rate*, which may vary with the level of income, by β_j, and the gains, monetary and in goods and services, by α_j, then disposable income

$$y_j=\sum_i (a_{ij}y_i)(1-\beta_j)+\alpha_j.$$

If we incorporate the effect of the tax term into the propensities to consume and write the new function as a', the system of equations defining the disposable income flows in the economy can be rewritten in matrix form as

$$\{y\}=[I-a']^{-1}\{\alpha\},$$

where { } designates a column matrix and [ ] a square matrix.

This disaggregated multiplier makes available a more realistic base from which to compute redistribution than the no-government abstraction which Dr. Prest quite rightly rejects. It is desirable to have some, but not all of the multiplier effects in the base. We are trying to identify the degree of redistribution in a world which includes very active governments and in which government is the major agent of redistribution. Why not compute as our base the (disaggregated) multiplier effect of the public budgets without any direct redistribution? Public expenditure is given. Now, hypothesize a tax structure which will take from each family just what it receives in cash and services from the government. That is, for every family (or sector), the effective tax rate, β_j, is set equal to the ratio of benefits to gross or pre-tax income, so that there can be no net transfer gain or loss from the provision of government services. This is neutral finance, but the income levels generated in this system are neither those appropriate to an Erewhon without a government nor those " which actually prevail under the existing taxation arrangements ". The base describes the incomes generated by " neutral " public budgets under the most reasonable condition: the government component in national expenditure is taken from the actual budget. The income distribution compared to this base embodies the direct and indirect effects of the primary redistribution. We must now question the assumptions back of that first step—the pattern of initial impact.[1]

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[1] The use of this model may be illustrated by reference to the results obtained in my matrix multiplier study. A four-sector matrix was constructed of the goods-producing sector and three income-size groups. The parameters in the test computation were the actual public expenditures for 1950, the effective tax rates on the three groups, and the three linear consumption functions. The lowest income group experienced a net transfer gain; the two high income groups experienced net losses. The estimated income generated by this model was $186 billion (less than $7 billion short of the actual total of approximately $193 billion). When the tax structure was redesigned to take from each group exactly what the group received from the government, the total income level fell to $177 billion, indicating a $9 billion multiplier gain from redistribution alone. The model estimated all incomes in the form of a size distribution; it is the comparison between the distribution generated by the neutral finance case and that generated by the matrix with the actual tax structure which measures the effect of redistribution by the government. It may be stated, provisionally, that the redistributive element adds income leverage to the simple multiplier effect from government spending. In addition, the final computation shows less equalisation than would appear from the first-impact computation: the rich appear to lose more and the poor to gain less when only the initial effect is measured. These are, of course, the results of demand changes following on the transfer of purchasing power. See Conrad, " Multiplier Effects . . . ," *loc. cit.*

II

Dr. Prest pointed out that the basic issue, the measurement of redistribution of real income, divides naturally into two problems: the estimation of changes in money incomes and in prices. Redistribution, he argued in his critical statement of the usual procedures, is necessarily considered in the context of a fixed real income. It is here that the basic contradiction, so sharply identified by Dr. Prest, lies. For, if we are to discuss a given real income, the supply of factors of production must have zero elasticity. But we cannot, then, assume that indirect taxes are passed forward to the consumer in price rises; this would depend on perfectly elastic supply of goods and services.

The disaggregated multiplier approach makes no such assumption about real income. Money income will change in the system, the direction of the change depending upon the propensities to spend and the direction of the initial transfer. Whether real income will change or not depends on the conditions of supply of the factors of production. In the usual Leontief matrix computation, the production functions are linear and homogeneous; there are constant returns to scale. In the goods markets, price elasticities of demand are zero. What are the implications of these rigid assumptions ? If the propensities to consume of the lower income groups are greater than the upper-bracket propensities, then any progressive initial redistribution must increase total spending. How much real income will increase depends on the amount of employment of factors generated by the increased spending and on the price changes which follow from the taxes and the increased spending. Any elasticity of supply greater than zero will, of course, lead to some necessary increase in real income.[1]

The treatment of indirect taxes, which is here formally but trivially rescued by assuming a highly elastic supply curve for labour (the Malthusian assumption of the Leontief system), is intended simply as an initial assignment. We insert the excise tax as a wedge raising the prices to consumers and, therefore, initially reducing their incomes. We do not consider this assumption about the direction of adjustment to be comparable to the usual analysis of shifting and incidence. It is simply the first step in the procedure by which the disaggregated multiplier traces the impact of both the tax and the spending out of revenue upon the absolute and relative demands for factors of production. In the light of this statement it should be clear that the crucial assumption is not the initial forward shift of the excise taxes. The real problems, here as in all goods- or money-flows analysis of tax effect, lie first in the supply schedules for factors of production and for money and, secondly, in the nature of the elasticity of demand for consumers' goods.

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[1] The problem of generated employment and the equilibrium of matrix multiplier systems is central to the real income question. Whether the system can reproduce itself or will either explode in inflation or contract continuously depends, in part, on the conditions of labour supply. In the present context it is sufficient simply to repeat the assumption that the supply of labour responds to inputs of consumer goods in perfect Malthusian fashion. But this introduces an important ambiguity with respect to time. The Malthusian response implies the Marshallian long period; on the other hand, the static matrix multiplier contains no such implication. The consequence of this ambiguity for our income analysis lies in the choice which is put to us: the increase in income received by a sector may be the result (1) of an increase in employment in the sector, or (2) of an increase in wage rates due to rising demand and inelastic supply. Only the first of these possibilities is compatible with the assumption repeated above.

Does the Malthusian nature of the supply of household services in the model contradict the treatment of direct taxes? I think not. The institutional structure of the work-week and the inability of employees to escape the income tax by changing occupations are sufficient grounds to support the identification of the income tax burden with the income to which the tax is addressed. This leaves unanswered the question of effort and incentives. I admit the possibility that taxes may induce employees and executives to put forth less effort on their jobs; I will not, however, attempt to quantify that possibility in the supply curves for labour until I have seen convincing evidence that it is more than a possibility. The example most often cited, that of the lawyers or physicians who decide not to take the marginal case, is numerically too small to carry much conviction for general procedure.

The crippling contradiction seems to be resolved. First, there is no necessity to fix real income; factor supplies need not be perfectly inelastic. Second, it is not an ultimate violation of that first assumption for me to argue that the imposition of a general income tax does not offer a sufficient opportunity to shift the supply curves of labour. It would be instructive to apply Dr. Prest's suggestion about deflating the income changes by retail price indices appropriate to each sector, but the base prices could not really be identified with the hypothetical neutral situation. The device, however, would be extremely useful in enabling us to eliminate the price inflation which the multiplier model cannot otherwise isolate.

The methods which Dr. Prest criticised have not been defended *per se*—I doubt that they can be in the face of his analysis—but have been shown to be a useful first step in more complete analysis of the question. I have been arguing that we must drop the assumption of a fixed real income when trying to isolate the effects of redistributive government fiscal policies. There are income-generating effects from government expenditures and there are additional income leverage possibilities in deficits and budget surpluses. What is less often recognised is that taxes and transfers, because of the interrelations of consumption and income generation, set off multiplier effects quite independent of those mentioned above. The matrix multiplier procedure developed from the Leontief input-output model makes it possible for us to isolate the redistributive influence of government budgets.

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Wage Policy and Wage Differences

By E. H. Phelps Brown

Mrs Wootton has given us an essay on differences in earnings.[1] Its main contentions are, that existing differences are not explicable by economic factors so much as by the belief that pay ought to be commensurate with prestige; and that a national wages policy should be applied, to allot shares in the total rise available annually, and give most of it to the lowest paid. These contentions are put forward in the first two chapters and the last; those between contain an account, along familiar lines, of the ways in which British wages are settled, and the kinds of argument put up when a wage claim is discussed; this last matter providing further support for the contention that the rôle of market forces in wage determination is subsidiary.

The opening discussion of the economists' account of wages notices the works of Rowe (1928) and Hicks (1932), but otherwise is largely confined to some more recent outlines or textbooks, in which the treatment of any one subject such as wages is necessarily simplified and abstract. There is no mention here of Adam Smith, Cairnes, Marshall, Taussig, or Cannan. Those who are examined are found to rely mainly, if with misgivings, on " a theory which explains wage structure in terms of a continual pressure towards equality of net advantages in all occupations, obstructed only by the practical difficulties of mobility, or by monopolistic manoeuvres ". Later references to economists' views are more sweeping. Thus, " professional footballers . . . operate under agreements expressly providing for *maximum* wages: economic textbooks have never heard of such maxima "—one thinks of Adam Smith, " masters are always and everywhere in a sort of tacit, but constant and uniform, combination, not to raise the wages of labour above their actual rate ". Again, " when abundant alternative opportunities are open, the dirty, the dangerous and the tedious jobs will at last be in a position to demand the high pay which the economists (in contradiction to all experience) have consistently ascribed to them "—one thinks of Taussig's *Principles*, " The broad fact is that the attractive and easy employments do not in general command the lowest pay. It is more nearly true that they command the highest pay. The common labourer or the miner receives less for his hard, dirty work than the skilled workman for his lighter and cleaner work; and this, tho' the latter's hours are usually the shorter and his employment no more irregular ".

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[1] *The Social Foundations of Wage Policy*. By Barbara Wootton. George Allen & Unwin Ltd. 1955. 200 pp. 15s.

But the economists having been represented as supposing the labour market to be dominated by a tendency for the net advantages of all employments to become equal, subject only to some obstacles to entry into particular employments, there follows an account of " some economic curiosities of British wage structure " to show that this supposal, to say the least, inverts the actual order of importance. Thus, the distribution of earnings is extremely asymmetrical, whereas that of I.Q's. is normal; the occupations with longer working weeks usually have lower, not higher, pay; differentials by region, sex, and age are anomalous on the presumptions of the economist; and so on. But all these facts, Mrs. Wootton contends, fall into place when we notice that the gradations of pay correspond closely with the social hierarchy, and see that " pay and prestige are closely linked; and (in spite of some exceptions) it is the rule that the high-prestige person should be also the highly-paid person; and *vice versa*. Once this rule is admitted as a factor in its own right, it is remarkable how effectively it explains much that, on a purely economic hypothesis, has to be explained away ".

As to these things—the facts are not so hard to explain by market forces, if we recognize that these forces work, here as always, in a social setting, and that the supplies of labour to different occupations are therefore very variously constituted and conditioned. Surely this has in fact been the traditional approach of economists. The obstacles to reaching equality of net advantages, Taussig wrote, " are in some small degree due to a quasi-monopoly in certain occupations; but in the main they are based on the great fact of long established social stratification ". Given this, and (increasingly nowadays) the effects of the limited supply of the higher innate abilities, the greater part of differences in earnings does seem capable of explanation by the usual analysis of the supply of and demand for a factor of production. Convention, prejudice, custom, ideas of equity, all play their part in the market, and no student of it could overlook them; but their effect is mostly to keep differentials as they are, whereas the remarkable thing about differentials in the last fifty years is the extent to which they have changed. The pay of the manual workers has risen relatively to that of the clerical, technical, and administrative; the pay of the unskilled has risen relatively to that of the skilled; the pay of women has risen relatively to that of men, that of juveniles relatively to that of adults. There have been wide movements of the relative earnings in different industries. These things can be explained by reference to the changes which have been coming about in supply and demand—in supply, notably, the extension of education and the social services which, with the general rise in real income, have given children a better start in life, and more chance of getting the jobs to which their innate abilities are suited; and in demand, the changes in the market valuation of different products, the expansion of central and local government, the changed techniques of production and administration; together with the effects of full employment in causing the higher grades to be manned up by promotion, or ' dilution ', and so concentrating shortages on the lower grades and the new entrants. Taken as a whole, with some institutional factors, these changes do account for the great upheaval of differentials. But will the hypothesis that " pay and prestige are closely linked " account for it ? Has the rise in the relative pay of the miner and farm worker been the consequence of an independently originated and commensurate rise in the esteem in which their callings are held ? Is it because of a fall in the prestige of the administrative class of the civil service that its real earnings, as Dr. Routh's study[1] suggests, have been halved since 1914 ?

The central chapters are devoted to the theme that wages are fixed not by impersonal market forces, but by men and women, who negotiate and adjudicate, not with economic, but with ethical arguments; at the same time, while all agree that rates of pay should be just, there is no pronouncement of public policy to show what constitutes justice.—Now it is certainly the case that the arguments with which wage claims are debated mostly rest on some principle of equity. There is also the sense, discussed by Marshall in his preface to L. L. Price's *Industrial Peace*, in which a fair wage for one group of workers can be defined, and ascertained in shillings and pence, if the wages of some others can be taken as an established framework of reference; much adjudication is concerned with the wages of small groups, and proceeds accordingly on this principle. But for the rest, the fact that the discussion is in ethical not economic terms proves nothing about its real arbitraments. Most chaffering, after all, is conducted in that way. There are particular reasons, moreover, why it should prevail in wage discussions: the trade unions, with their historic concern to " take labour out of competition ", and establish a minimum based on human needs, are reluctant to rest a claim on the balance of supply and demand even when that is strongly in their favour, lest the argument be turned against them when the balance tilts the other way; the very word " wages " in the Bible has the meaning of " deserts ", and we all carry out into the market place the ideas of distributive justice which naturally prevail at the family table. But the approach is one thing, the outcome another. Wherever the arguments from equity may seem to put the wage, there is one point beyond which it will begin to choke off the supply of labour, and another beyond which it will begin to choke off the demand; and the viable wage has to lie between them. Sometimes they are fairly clearly marked, though in recent times the upper limit has been uncertain—hence the greater weight thrown on the principles of equity, and the greater sense of bewilderment that no code of them has been promulgated. But the claims of equity still do contain pointers to the viable wage—the three main ones, Mrs. Wootton's survey shows, have been the cost of living, fair relativities, and undermanning, all of which are some guide to the movement of the market; and perhaps it is because of this that, as a leading article which Mrs. Wootton quotes from *The Times* remarks, when " arbitrators absorb a vast quantity of information and statistics, all of it provided by interested parties and little of it adequate, and then, without any accepted principles to guide them, ponder it until there emerges, by some means that must go far beyond logic, a conclusion ", " the mystery is that the conclusion is so often generally felt to be about right ".

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[1] Guy Routh, " Civil Service Pay, 1875 to 1950 ", *Economica*, August, 1954.

The last chapter propounds a national wage policy aimed at the " destruction of plutocracy and the setting of an equalitarian society in its place ". The first step will be to estimate and announce the total increment of earnings available for division annually; the second, to allocate this so as to give priority to raising all rates still below a given level, with a tapering off above this, and no rise at all for any rate over a certain maximum; with such modifications only as may, exceptionally, be unavoidable to maintain adequate recruitment in a particular employment. Perhaps because of her previous conclusion that differences in earnings depend largely on the hierarchy of social prestige, Mrs. Wootton now treats them as malleable, without examining the evidence—the comparative statistics and their interpretation (Pareto, Gibrat, Roy, for instance) and what we know of wage policy under communism—which warns us of how deep the roots of inequalities go, and what functions they serve as incentives. But she does recognize that her policy would meet the opposition of our trade unions as at present minded; on this she remarks only, " to answer in advance that success is impossible is to make the very grave admission that in one large and important tract of social policy the government does not govern, but abdicates in favour of the trade unions; and to accept conditions which must continually threaten to frustrate every attempt at economic as well as social planning ". In fact, it is to admit that the state is not totalitarian. The government of a free country does continually abdicate in favour of institutions—of the family, the churches, the colleges, as well as the unions; that is part of what we mean by calling it free. It remains an acid test for any national wage policy, how in a free country men are to be made to go on working for pay which has not been arrived at in some form of settlement with which they identify themselves.

But reaching one of those settlements is sometimes desperately difficult, not least when a differential is in dispute, and it is a fair question for the economist, what help he can give the negotiators. My own view is that he certainly cannot provide any prescription which would make bargaining unnecessary, and enable rates to be deduced by a process of judicial construction: I believe that these rates have to be hammered out by the parties to them, not only because it is they who will have to work with them, but because it is also they who know best what are the conditions of supply and demand for labour in the industry. What help the economist can give them in matters of principle will be only by drawing out the implications of the different types of claim advanced: he can show that if the parties really mean to adhere to criteria which require departure from the balance of supply and demand, they must be prepared to accept certain measures of compulsion; and that if they do try to strike such a balance they are not neglecting human values, but are in fact satisfying a basic requirement of a free society.

The need for measures of compulsion arises because, however strongly we may hold as producers that pay should be fixed by such criteria as equality, status, or job evaluation, we ignore those criteria as consumers, in which capacity we are usually willing to pay only according to our judgment of what things are worth to us, irrespective of who made them. That is why the kind of question that is put about wage differentials makes such evident nonsense if it is applied to product prices: if onions are sixpence a pound, what is the fair price for tea? Now the employer has to transmit the consumer's valuations back into the market for services, where they impinge upon existing rates. If those rates are to be pinned by criteria which make no concession to supply and demand, a misallocation appears: there will be shortage of one kind of labour, redundancy of another. But meanwhile the existing wage structure is also being brought under pressure from the side of supply: changes will be occurring in the availability of different kinds of labour at the going rates. Here again maladjustment will occur if the rates cannot give—should more and more of our young people have the chance to go through college, while the belief prevails that a graduate inherently deserves an unchanged differential over manual rates, many graduates will be priced out of the work they can do best. In sum, if the claims made for differentials imply, as they usually will, rates of pay that do not balance the supply and demand for the kinds of labour concerned, then either shortages and surpluses of labour will persist, or else controls must be imposed on consumer spending, or on the deployment of labour, or both. In particular, any thoroughgoing attempt to fix differentials according to principles which disregard market forces is likely to lead to the direction of labour.

By the same token, it can be submitted that these same market forces, for all the harshness with which they impinge on some men at times, have a humane function to fulfil. In fact they serve to combine two freedoms which might seem irreconcilable: freedom to spend, within one's means, as one thinks best, and freedom to engage in what work one prefers, within the range of jobs accessible. How is production to meet the needs of consumers, when it is carried on by men who are free to consult their own wishes about what work they shall do? It is through the play of supply and demand in the product and factor markets that the two freedoms are reconciled. The negotiators who seek the rate at which the supply and demand for a certain kind of labour will be balanced, are making it possible to maintain those freedoms.

In saying this I do not forget how difficult it often is to ascertain that rate with any certainty; nor what allowance must be made for convictions that are widely and sincerely held. I do not hold that wage policy is only a matter of adjusting to market forces. But when the issue is raised that is before us here, the issue of differentials, then I would say that these of themselves are not a useful object of negotiation or policy. When we give up trying to fix each rate on its own merits, and make the relation between two rates an object in its own right, we involve ourselves in increasing difficulties. It is only as each rate is adjusted under such indications as are available of the play of supply and demand upon it, that it can fulfil an essential function of rates of pay in a free society.

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Book Reviews

An Economic History of England: The Eighteenth Century. By T. S. Ashton. Methuen. 1955. vi + 257 pp. 18s.

Many kinds of questions have been asked of History in her time. She has answered them meekly and the questioners have gone away satisfied, sometimes with the plaudits of interested parties ringing in their ears. If in the process she has acquired a somewhat damaged reputation, writers on economic and social history are in no position to cast the first stone. But Professor Ashton makes it clear from the beginning that his motives are strictly honourable; he tells us in the Preface that his object is to find answers to the questions which economists ask or should ask of the past; and he goes on until he gets the answers his evidence supplies and no further.

This is a restricted approach: he himself says the window of the economic historian is a narrow one, but the vision which it permits is both concentrated and penetrating. Above all, it accords with the spirit of the age, " an age of political arithmetic " when interest in economic matters was directed " largely to things that could be measured and weighed and calculated ". His master, Adam Smith, would approve of it and would no doubt appreciate the refinements which he is able to bring to the study of their common problems. Every chapter has its own structural unity determined by the chosen conceptual frame of reference and each step in the logical process provides opportunity for illustration and comment drawn from a lifetime's reading and thinking. The result is history, but the economic kind of history; it stands in its own right and exemplifies the art of history while conforming to the austerities of a prescribed logical framework.

Placed in this theoretical and empirical context, familiar themes take on a new look, e.g., the discussion of the Navigation Acts, the Corn Bounty, the importance of water supply to industrial location, the social effects of currency problems; and in his treatment of the industrial aspects of agriculture, the part played by the widening range of marriage choice over the quality—and the quantity—of population, and the brilliant section on the Exchange, he breaks new ground. The social transformation consequent upon economic change is conveyed by implication and example as, for instance, in the fascinating account of Wilmslow changing ineluctably—and for the better—under the influence of technological innovation and capital investment (p. 214–16. The index omits this and most other place names). The general effect is to present the 18th century as a succession of small localised changes, accelerating in the later years of the century but never getting out of hand because they are indissolubly connected with one another, the master key to the mechanism being the rate of interest. The Industrial Revolution has vanished, and a continuous process of economic change under the influence of increments of investment has taken its place, with social implications which the reader may decide adds up to a revolution. But he must do the adding for himself.

In Professor Heaton's phrase, this is pre-eminently a case of Clio in overalls; but they are of the latest cut and worn with an air and sometimes with a smile. We are told for instance that some of the immigrants escaping to England from religious persecution were like the American missionaries to Hawaii who came to do good and stayed to do well; and since of the 810 merchants who kissed the hand of George III at least 250 " must have been of alien origin " (p. 140) there was evidently some truth in the comparison. The licence allowed Bishop Tucker in footnotes on p. 19 shows that overalls do not forbid an occasional caper. There are flashing quotations which both illustrate the text and illuminate the age. Walpole, for instance, having lost a bet to Pulteney in the House of Commons on the subject of a misquotation of Horace, flung the winner a guinea with the remark that " it was the first public money Pulteney had touched for a long time ". The text in this case is the importance of saving in a society which had a passion for gambling, and over against the gamblers is set the merchant John Pinney who " took care, on the birth of each male child, to open an account in which the infant was debited with the cost of the midwife, the fee for the baptism and its share in the wages of the nurse ".

There is therefore plenty of " social " history, but it is part of a texture of thought rather than a tissue of facts. Perhaps there are times when the texture of thought calls for a stronger tissue of facts. Admitting that " a rise or fall of one per cent. in the price of capital might affect the decision as to whether to build a house or a shop or sink a mine ", a reader with his eye on what happened in his own region may ask whether the competition of government borrowing ever really handicapped the innovator with a bright idea to sell. The example of Strutt is interesting but not decisive for, though he failed in London he succeeded in Derby; and having got the help of his neighbours he went on to help Arkwright and Arkwright came to the help of Oldknow. These examples do not contradict the thesis, but we would have to know more about them before we could be sure they supported it.

Another example of the divergence between the regional and the metropolitan view is the importance attached to the Gin Age. To say that " it may have been responsible for the retarded growth or actual decline of population in the thirties and forties " and to associate its decline so closely with the Act of 1751 raises several difficulties. The first is how far, if at all, the demographic effect was felt outside London. This reviewer can find none in his own region. The second is that it overlooks the possibility that the check to population was given not in the thirties but in the early twenties. To the regional historian there appears to have been some other agency at work before gin took over as the chief killer (if ever it did). The possibility cannot be ruled out that the cause of the population check lay in a succession of widespread epidemics not connected with gin and not necessarily with harvests. The Gin Age may be a symptom rather than a cause, a pathological outlet for surplus resources which would have been consumed as food if smallpox and influenza and typhus had not killed off a significant number of potential consumers. The interesting series of figures provided by Professor Ashton at the end of his book does nothing to refute this view: except for the consumption of spirits the home market for the secondary products of agriculture was stagnant or even declining; and if the figures for printed cottons are any guide to the growth of the cotton industry, the check was felt here too. Lewis Paul complained of the shortcomings of his labour force (p. 211); it seems he had to contend with a dead market as well. His heir and successor Arkwright had no reason to complain of either. Considering that the '20's and '30's was a period of peace and low interest rates the home market was singularly quiet, and investment in enclosures, turnpikes and navigations was similarly unresponsive. The upward lift in all these came with the fifties. There was a great increase in the export of grain and prices rose and perhaps this had something to do with the success of the Gin Act of 1751. The Age of Gin was ended, as Professor Ashton says, and so was the demographic depression, but the connection between the two either at the beginning or the end of the cycle is by no means established. The claim of an independent demographic factor which for considerable periods may have removed the direct pressure of population upon subsistence with important effects upon the standard of life, the supply of labour and the buoyancy of the market, cannot be ruled out as one of the factors affecting the nature and timing of economic change.

Whether these speculations have any force or not, they accord with Professor Ashton's conception of economic history and illustrate the kind of stimulus which his combination of empirical and analytical enquiry evokes. In his hands it has revealed the economic behaviour of Englishmen during the period of transition to industrialism with unexampled clarity and conviction: within its limits the account rings true, and it is the virtue of Professor Ashton's non-dogmatic conception of history that if a false note is sounded the flaw can be detected and put right. But the price has to be paid in some restriction of vision, and the question remains whether the restriction is inherent in the method. Cannot the window be widened and the vision extended? Professor Ashton implies that they can. In a masterly paragraph on the disproportionate part played by the Dissenters in economic life (p. 19–20) he attributes their success not to their religious beliefs which varied widely and were frequently contradictory, but to three main characteristics they possessed to a higher degree than most of their contemporaries: family unity, sound education, strong conviction. These were the predispositions that made for economic success. And in a passage which loses none of its challenge for the quiet irony with which it is expressed, he shows that the economic historian must recognise the wider humanity of those whose economic behaviour he describes. " Economic historians ", he says, " are concerned primarily with groups. Some indeed write their stories in terms of *the* capitalist, *the* entrepreneur, *the* wage earner, as though for each group there were an ascertainable norm, divergences from which might safely be ignored. In fact, the samples available to historians are really, in the statistical sense, random, and in any case, are usually too few in number to support large generalisations. Any statements about English society in the eighteenth century must be regarded as tentative. Men and women were highly individual: one characteristic they had in common was a refusal to conform " (p. 17). In order to explain the characteristic economic behaviour of Englishmen in the 18th century it is necessary to take account of the nature of Englishmen as a whole. This is an important methodological admission and enlarges the debt, already inestimable, which the study of modern economic history owes to Professor Ashton. It shows that though the window of the economic historian is narrow, his vision has to take in not only the topography of the economic landscape but the strata on which it rests. Perhaps it is in this direction that there is scope for widening the window and extending the vision.

J. D. CHAMBERS.

Elements of Pure Economics; or, The Theory of Social Wealth. By LÉON WALRAS. Translated by WILLIAM JAFFÉ. George Allen & Unwin Ltd. 1954. 620 pp. 42s.

If the most important truth which economics teaches is the organic unity of the whole economic world, the essential interpenetration of all parts and aspects by all others, it was Léon Walras who first created a system of economic thought entirely suspended from and dominated by this greatest of economic ideas. Like a vast arch, complete and strong yet unable to dispense with a single one of its composing voussoirs, Walras's work, archaic and clumsy in detail though it may seem to us, is surely the greatest piece of architecture that economics will ever produce. It is in a deep sense timeless. Even in its more accidental features it has an astonishing and almost physical vitality. Not only its central ideas but its definitions, arguments, arrangement, and its very forms of words have been projected through the lens of Pareto on to the pages of the Italian economic textbooks of today. Forty-five years after Walras's death at the age of seventy-five, and sixty-three from his retirement, there can be few still living who sat at his feet; but how interesting it would be to know what he was like as a teacher. His filial piety, the patient, careful masonry of his work, his generous acknowledgment (as soon as he became aware that others at earlier dates had evolved some ideas which he himself had independently arrived at) of the priority of Gossen, Jevons, and Menger, give the impression of a warm and admirable character. Perhaps we ought to be content to know him through his writings. But the details of his life, so far as they can be known, will be told in a volume on *The Life and Works of Léon Walras* which will complete the monument that Mr. William Jaffé has begun with this superb translation of the *Éléments*.

Mr. Jaffé seems to have provided the reader who wishes to follow in detail Walras's own argument and the lively debates which even today centre upon it, and to discern the origins of his ideas in the earlier literature and especially in the teaching of his father, with almost everything that he could need in connection with Walras's text. The English style is easy and unpretentious, and is in fact real English and not that curious astigmatic no-man's-tongue which makes the work of some translators, who have only a synthetic knowledge of English, so dangerous and misleading. Mr. Jaffé has provided what he modestly calls "Translator's Notes", running to 63 pages, which are really a splendid *apparatus criticus*, guide, and bibliography. Here Walras's mathematics are explained with such care and detail that anyone can follow their meaning and effect. The sources briefly referred to by Walras are fully documented. Modern criticisms of Walras's argument, such as those of Patinkin, are discussed. One of the most helpful features of these Notes is the cross-indexing they provide of Walras's references, explicit or more often implicit, to other parts of his own text. The Notes are followed by a "Table of corresponding Sections, Lessons, and Parts for all editions of Léon Walras's *Éléments*", running to five pages, and this again by a section of 46 pages called "Collation of Editions".

Mr. Jaffé does not tell us how many years he has devoted to the making of this superlative edition, worthy indeed of an original which is one of the half-dozen greatest classics of our subject. In raising a monument to Walras he has, I think, given his own name a notable and permanent place in our literature.

G. L. S. SHACKLE.

Federalism, Finance and Social Legislation in Canada, Australia, and the United States. By A. H. BIRCH. Clarendon Press, Oxford. 1955. xiv + 314 pp. 35s.

The subject matter of this book covers the constitutional problems which arise in a Federation out of the financial relations between the Federal government and the State (or Provincial) governments. This subject is treated with special reference to the growth of social security legislation over the last half century, a development which has given rise to important constitutional problems because it was not foreseen when the Federal constitutions under examination were drawn up and because it has greatly affected the financial relationships between the Federal and the State governments. The author has confined his study to Canada, Australia, and the United States, because the constitutional, political, social, and economic situations in these three countries are sufficiently alike to make a comparative study profitable.

The great merit of this book is that it gives a clear and precise account of the actual historical developments in these problems in these three countries. It is, in fact, a first-rate reference book. But it is also more than a mere reference book. The author brings out clearly the striking uniformity in the basic problems which have confronted these three Federations. He shows how each of them has been confronted with a growing financial dependence of the State governments upon the Federal government; how in each case there has grown up a recognised need for the Federal government to take steps to see that there is a reasonable degree of uniformity in the provision of social benefits throughout the States; and how in each case there has arisen a serious problem whether, and if so how, the Federal government should give financial aid to the poorer at the expense of the richer States. The author also provides an interesting account of the divergent methods by which these closely related problems have been tackled in each case.

This book is written on a constitutional problem by a lecturer in government. The economist must not, therefore, expect to find in it any extensive analysis of the economic, as opposed to the constitutional, effects of these problems and of the solutions found for them. The economist who is, for example, interested in the recent controversy between Messrs. Scott and Buchanan (see *Journal of Political Economy*, 1952) on the effects upon economic efficiency of a subsidisation of the poorer by the richer States in a Federation will find in this book a storehouse of information about what has actually been done in the way of such subsidisation in these three countries, but he will not find any analysis of the effects of this subsidisation on movements of labour and capital within these Federations and so on the efficiency of the use of their economic resources.

The clarity of exposition in this book suffers from some illogicality and disjointedness of arrangement. To mention the most obvious example of this, the author starts with an historical account of Federal-State financial relationships for each of the three countries. But the chapter on the United States takes the story down to the outbreak of the *Second* World War and includes a detailed account of the New-Deal developments; the chapter on Canada takes the story down only to the outbreak of the *First* World War and leaves the treatment of later developments in both Federal-Provincial relationships and in social security legislation to later Chapters; and the chapter on Australia takes the development of Federal-State financial relationships down to the middle of the Second World War, but leaves the whole development of social security legislation to a later chapter. After these historical surveys the author seems unable to decide whether he will treat the subsequent developments historically for each country separately or subject by subject for all three countries together. There may be good reasons for his arrangement, but if so the reviewer has missed them. To him the analysis would have been much clearer if a complete historical account for each country had been succeeded by a subject-by-subject treatment of the many interesting uniformities and divergences of problem and of solution.

J. E. MEADE.

Principles of Public Finance. By HUGH DALTON. Routledge & Kegan Paul Ltd. 1954. xvi + 255 pp. 10s. 6d.

It was a very good idea on the part of Mr. Dalton to issue a new edition of *Public Finance.* First published in 1922, the book was a pioneer achievement in breaking from the narrow Victorian outlook on the subject which emphasized the tax side almost to the exclusion of everything else. Dalton's was the first book in this country to put public finance in the wider background which is now universally acknowledged to be its right, and to give due weight to the expenditure side of the budget. Moreover the book is simply and clearly written and eminently readable. In addition we now have the piquant experience of the teacher who found himself become practitioner.

Mr. Dalton has spared no pains over the work of revision. He has sought the help of some able young economists in the Labour Party and rejected the blandishments of others. He has gone through every word, and innumerable verbal alterations throughout the work testify to second thoughts or minor retreats from positions once held to be impregnable. Further, we have five new chapters, two on the public debt and three on the budget and Dalton the Chancellor. Nevertheless, inevitably, and in a sense rightly, the book retains its original flavour. At the back of Mr. Dalton's mind is still the world of the first decade of the century, although later events have given rise to palimpsests of varying opacity. The argument proceeds in the leisurely fashion of some famous passages of Marshall, rather than by the method of what would now be regarded as analysis.

For Mr. Dalton there are two cardinal principles of public finance: that the primary business of the art is to redistribute income and wealth and that " the case for a gradually falling interest rate is firm ". Equity consists essentially in taxing the rich at highly progressive rates; there is no mention of that other equity which has ever been the pride and strength of the British tax system: equal treatment of persons similarly placed. In pursuit of the first aim we are told that there is a strong presumption against imposing any taxation on the poorer members of modern communities, even presumably if at the same time they are receiving more in social expenditure than they pay in taxes. This precept however, did not prevent Chancellor Dalton from raising about £94 mn. additional revenue in tobacco tax in 1947 from the poorer members of the community. This was fortunate, since it was undoubtedly the best budgetary method available at the time of containing consumer spending.

In support of the ever falling rate of interest Mr. Dalton can quote impressive witness both from Keynes and from other well established economists—but it all relates to the 1930's or the war period; Mr. Dalton resolutely shuts his eyes to the possibility that circumstances may alter cases. Mr. Dalton is very proud of his reduction of the debt charge due to the lowering of interest rates on short-term debt (which he rather oddly calls a conversion); but he does much less than justice to the conversion operations of 1932 and the succeeding years, because he leaves out of account the flood of industrial and local authority conversions which they permitted.

It is stoutly denied that the creation of credit in 1946 and 1947 in the effort to force down long-term rates was inflationary. Dalton will not even now admit that the " dry inflationary paper " with which the *Economist* accused the Chancellor of littering the market can have provided tinder for the Korean stock piling boom. On the other hand Mr. Dalton appears to be somewhat disillusioned concerning the " beauty " of raising revenue through the printing press; " advantage " now supplants the earlier more enthusiastic expression, and even this is immediately qualified by reference to costs and disadvantages.

In the new Part V, Dalton the Chancellor introduces the Parthian shot which he never had a chance to fire from his secret weapon: the gun to shoot bears, by making them compulsorily invest in gilt-edged in order to keep the long-term rate from rising. It is to be wondered whether the full implications of this had been thought out, if indeed it is intended to be taken seriously. For we have already learned from Dalton the public finance specialist that forced loans have grave disadvantages as compared with either taxes or voluntary loans.

URSULA K. HICKS.

Histoire de la Pensée Économique au XX^e Siècle. By ÉMILE JAMES. Presses Universitaires de France. 1955. Tome I, pp. 1–308; Tome II, pp. 309–711. Fr.1,000; Fr.1,200.

A writer undertaking a history of recent economic thought needs a good deal of courage. Apart from the sheer volume of material, the lack of a temporal perspective makes it difficult to identify the leading trends of current research and the main contributions to the advance of economic knowledge.

In these volumes Professor James has, to some extent, played safe. He has deliberately preferred exposition to critical analysis (he often finds some proposition " tres discutable ", but doesn't explain why), and in examining each system " dans toute son ampleur " he summarises representative works of acknowledged importance, such as those of De Man, Hicks, Schumpeter and Stalin, instead of attempting to synthesise alternative versions of a given approach. The specialist will find the treatment of his own particular field somewhat sketchy but in this age of specialisation few economists can fail to benefit from the study as a whole. The main themes of twentieth century economic thought, e.g., disequilibrium, unemployment, the integration of monetary and real economics, the concept of economic control, are repeatedly emphasised, and the principal new techniques, e.g., macro and dynamic analysis, the predilection for mathematical reasoning and quantification of data, are lucidly described. While much of the analytical content of modern economics is necessarily absent, its main components are presented against the background of earlier writings and their implications are admirably discussed.

The author covers a wider range than the American *Survey of Contemporary Economics*; his province is economic thought rather than economic analysis. Volume I deals with the period 1900–1936, and includes chapters on the revision of Marxism; amendments to and methodological attacks upon marginalism; the idea of economic control; disequilibrium; " dirigisme " and the liberal reaction. Volume II surveys Keynesian economics; new approaches such as national income accounting; short term analysis; and long-term problems (economic growth; communist thought; the future of capitalism; and ' structural ' economic reforms). Each volume contains a chapter by Jean Weiller on international economics.

Professor James' History raises interesting questions concerning the international mobility of economic ideas. English readers will find many references to the works of continental economists which are either unknown or insufficiently studied in this country. Among many names, those of Aftalion, Dupriez, Guilbaud, Landry, Marchal, Perroux, Pirou, Rist, Reuff, Simiand and Sorel are given special prominence. While continental thought has evidently proceeded on lines roughly parallel to those followed in English-speaking countries, the extent to which the French language has acted as a barrier between non-competing groups of economic writers is surprising. The most instructive part of Volume II is the story of Keynesian economics since the publication of the *General Theory*. Professor James reveals the sequence of events in unmistakable terms, from the initial over-enthusiastic reception to a critical reaction and thence toward the emergence of a more balanced appreciation of the merits and deficiencies of Keynes' performance. With the professionalisation of scientific economics the unfolding of this sequence has been much more rapid than it would have been 50 years ago. That the author's appraisal of this performance holds out no great surprises for those familiar with recent Anglo-American writings may be due to the fact that French economists are less insular than their British counterparts. May we then complacently assume that English-speaking writers have in fact provided the decisive influences shaping modern economics? Or does this study merely suggest that Professor James' Gallic vantage point is too close to our own stream of thought to enable him to draw substantially different conclusions?

A. W. Coats.

An Econometric Model of the United States 1929–1952. By L. R. Klein and A. S. Goldberger. (*Contributions to Economic Analysis.* IX.) North Holland Publishing Company, Amsterdam. 1955. xv + 165 pp. 34s.

This book exhibits modern econometrics at its best, even though within a year its quantitative results have been outdated, and within five, or at most ten years its methods will be antiquated. With its publication, the long struggle of econometricians with the U.S. economy has taken a leap forward. It is a far more mature work than its predecessor, Klein's Cowles Commission, *Monograph 11*, and has the great advantage of having much better data with which to work. It is one of the trials and joys of this type of work that fresh and revised data are constantly being published. The present model, computed very carefully with all the available data of spring, 1954, is now, as the authors point out in their preface, outdated and probably considerably in error because of the revisions published by the Department of Commerce in July of that year.

A careful reading of this book should once for all give the lie to those who refer contemptuously to the estimation of such models as " turning the handle of the sausage machine ". A fully detailed model like this calls for a rare mixture of technical competence and economic intuition, buttressed by a great deal of sheer hard work and ingenuity. Artistry appears at every stage, specification, data collecting, estimation and forecasting.

The model has a few non-linearities, which makes estimation, which is by the limited information method, rather tricky. Some very ingenious advances in computational design have been made here, enabling experimentation to be performed comparatively cheaply. In preparing forecasts, great attention is paid to recent trends in the residuals from the fitted equations, and their constant terms are adjusted accordingly. There is clever use of results from sample surveys in computing several structural parameters, and the very careful analysis of the public finance sector in preparing forecasts is a great advance. Alternative fiscal policies are proposed as reasonable, and the quantitative implications of these Klein-Goldberger variations are investigated.

The most serious defect of the model, and one which the authors admit, is its treatment of gross private investment as a single endogenous variable. It is almost certain that better results would be obtained by breaking it down into its components of housing, commercial construction, producers' equipment and inventory change. Decisions about these variables are made on varying grounds and by varying groups of people, unlike the more homogeneous category of consumption. The implied disaggregation would mean many more variables but would improve the system: it is only fair to add that the authors intend to do just this.

The book is clearly and tersely written, with plenty of helpful diagrams, and a very honest presentation of the data. One of the most salutary lessons of all the work done and inspired by Klein is the constant preoccupation with the importance of the data.

Peter Newman.

The Theory of Wages. By K. W. Rothschild. Basil Blackwell, Oxford. 1954. viii + 178 pp. 18s.

In one way, this book may be recommended to students, for the first eight chapters contain a survey of the theory of wages which adds to the older analysis the contributions of the more recent theory of imperfect competition. The treatment does not go deep—in the account of marginal productivity, for example, there is no mention of the adding up problem; but the limits may be wisely chosen for the undergraduate, and within them the exposition is patient and clear, with neat numerical examples.

But, in other ways, I am bound to state some reservations. Dr. Rothschild reminds his readers that this is a book of theory, and they must go beyond it to get a picture of the real world, but in fact his own treatment is infused with a view of society. He has nothing good to say of employers. " The ordinary employer ", he says, " . . . will only be interested in maximising the output of the worker over that period during which he is employed by him ", and " the tendency (since it is more profitable) will be to aim—by longer hours or greater intensity of work—at a maximisation of output over a part of the worker's life only, and then to replace him by a new worker ". " The naïve belief in the proportionality between output and hours of work seems to be deeply ingrained into the mind of many employers ". Again, though any theory of wages requires a theory of profits, they appear here only as a rake-off that gets maximised. Monopoly profits " may be hoarded as reserves ", but in general savings appear as coming out of the income of " the capitalist class " after they have provided for their " conspicuous waste ".

In not a few other respects the underlying picture of the world is an old-fashioned one. There is next to no social mobility. Monopoly has been growing. Money wages have become more rigid. Wage earners save little. In the early 1930's " one or more earners in most families were unemployed ".

General unemployment makes workers less mobile (p. 76), more mobile (p. 144).

In the handling of theory, a definition is sometimes used as an explanation. The coefficient of elasticity is the account of an outcome and not a cause of it, and to explain changes in earnings by the elasticity of demand for income is like saying that the rate at which a liquid evaporates depends on its volatility. Similarly, in the treatment, derived from Kalecki, of the share of wages in national income: as this is given here, the degree of monopoly is made identical by definition with the ratio which the excess of selling price over average direct cost bears to this cost, and it is a tautology, not an explanation, to say that the share of direct costs in total receipts depends on this.

E. H. PHELPS BROWN.

Constructive Liberalism: The Rôle of the State in Economic Development in Georgia to 1860. By MILTON S. HEATH. Harvard University Press. London: Geoffrey Cumberlege. 1954. viii + 448 pp. 60s. net.

This is the last of a series of four studies written by prominent American economic historians.[1] Each book has been concerned with the rôle of government in the early development of a state selected as representative of one of the four principal economic areas of the United States prior to the Civil War of 1861–1865. If any single conclusion can be drawn from all four studies, it is that in the early days there was a positive and consistent policy of state government promotion of private and public welfare. Generous use was made of subsidies, controls over labour and business, directed railroad construction and land use planning to achieve full resource employment, income stabilisation and economic growth. In early America, a somewhat liberalised Mercantilist philosophy of benevolent state control seems to have predominated over *laissez faire* in both theory and practice. Contemporary popular opinion notwithstanding, the Welfare State appears to be in the best American tradition. Classical free enterprise—if it ever existed outside the imaginations of some nostalgic news editors and tax-troubled tycoons—is a relatively recent notion.

Constructive liberalism, as defined by Professor Heath, is the belief that the government, as the basic social organisation, exists by the will of the governed and for the benefit of the governed. It implies that the government should be used as the natural instrument for promoting the public good. Professor Heath, in this clear and comprehensive study of *ante-bellum* Georgia, finds that while there was a continuity in this philosophy between 1732 and 1860,the course of public policy ran through five distinct cycles from an attempt at positive economic planning to laissez faire. As a rule, Georgians did not look on regulation as a solution for all of their economic problems, but they were greatly interested in using the state, and later the local governments, as positive instruments of public developmental policies such as land distribution, capital creation, removal of Indians and railway construction.

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[1] The other three books, all published by Harvard University Press (London: Geoffrey Cumberlege), are: J. N. Primm, *Economic Policy in the Development of a Western State: Missouri, 1820–1860;* Louis Hartz, *Economic Policy and Democratic Thought: Pennsylvania, 1776–1860;* and Oscar and Mary Handlin, *Commonwealth: A Study of the Rôle of the Government in the American Economy: Massachusetts, 1774–1861.*

When statutory railway regulations failed in the eighteen-fifties they even demanded state enterprise as a substitute and competitor for the private companies. Without entering the area of detailed administrative regulation, Georgians nevertheless looked to the state for centralised overall control of land, capital and transportation policies.

Professor Heath traces the economic history of Georgia through its British and colonial background with emphasis on the economic philosophy of the period, the growth of a credit and paper money system, regulation of economic activity and the rise of a landed aristocracy. Then the post-revolutionary problems of finance, currency, land speculation, slavery and Indians are examined in detail. There is elaborate documentation throughout the book.

The main arguments of this study, however, come in the third, and final section which consists of nine chapters dealing with the development of public economic policy. The rôle of the state is considered in relation to several major areas of economic activity including banking, waterways and roadways, railways, corporate business enterprise, human resources, public utilities and fiscal policy.

This book provides an insight from a new quarter into the current economic and political problems of Georgia. Most observers tend to explain the paradoxes of modern Georgia largely in terms of the Civil War and " reconstruction " periods with little emphasis on the development of philosophy and economic policies prior to 1860. Georgia is an old society by American standards with a recorded history of organised life going back to the early eighteenth century. The contradictions of contemporary Georgia can be seen arising in this earlier period when a frontier individualism merged with a deep-rooted equalitarianism and sense of social justice; when a respect for private enterprise was tempered by demands for state protection against corporate exploitation; when middle class liberalism and the radicalism which arises from extreme poverty struggled against land speculation, political inefficiency and slavery. The problem of free men in an organised society was no different in principle then from now: how to preserve the best of the past—of a way of life that has proven to be secure and satisfying to many—in the face of a changing civilisation which requires new ideas and the adoption of new methods in order to survive.

WALTER S. BUCKINGHAM, JNR.

A Million Random Digits with 100,000 Normal Deviates. By THE RAND CORPORATION. The Free Press Publishers, Glencoe, Illinois. 1955. xxv + 100 pp. $10.

This table of random digits is ten times as large as any set previously published. Production on this scale has become possible only in the past ten years by the use of electronic computers. The compilers used what was in effect an electric roulette wheel, operating at the equivalent of 3,000 revolutions per second, and drew a digit every second. Even so, there were found to be small but significant biases which modifications to the circuits did not entirely remove. The numbers were therefore added in pairs modulo 10 to give the set here presented.

The digits have been very carefully examined and pass all the customary tests. They can therefore be confidently recommended and will prove very useful in the ever increasing field of experimental sampling, where large amounts of random digits are often required.

The tables of normal deviates are also an improvement on existing tables, being again 10 times as big as the largest previously published and giving the deviate to three decimal places. They were compiled by applying the random digits to tables of the normal integral, a method which seems to be superior to those involving the cumulation of rectangular deviates and reliance on central limit effects. These values also have been carefully tested, especially near the tails.

The numbers are very legibly reproduced by photo-effect from cards printed by an I.B.M. Cardatype. The work is a very welcome addition to the statistician's and the computer's library.

M. G. KENDALL.

The System of Industrial Relations in Great Britain. Edited by ALLAN FLANDERS and H. A. CLEGG. Blackwell. 1954. viii + 380 pp. 30s.

The editors of this book set out to meet a real need. Post-war industrial conditions have led to a greatly increased interest on the part of the public and of all sections in industry in what, for want of a better term, are loosely called " problems of industrial relations ". For students and for those directly concerned with these questions in industry an authoritative reference book has long been required.

There is no doubt that this book is useful and will be widely used. There is equally no doubt that it does not fully achieve its purpose, partly because of the method used, but mainly because of the nature of the subject it sets out to treat.

The editors realised that no one person could deal satisfactorily with all aspects of the study and decided to make the book a symposium of expert contributions. Unfortunately, it remains a collection of essays and never becomes a unified study. Strenuous efforts have clearly been made to avoid overlapping but the same topics do none the less appear in chapter after chapter. Joint consultation, for example, not only has a chapter to itself, but creeps into every other section of the book.

But this weakness of method is not the real source of the trouble. When we try to disentangle the many elements which affect the way men work together in industry and the conditions which influence the relations between individuals and groups we are embarking on a subject almost as wide as life itself. Since there is no general agreement as to what we mean by " industrial relations " a book which sets out to analyse the system of industrial relations cannot really hope to arrive. If by " industrial relations " we mean the formal relations between the organisations of employers and trade unions then we know we require an historical introduction, an analysis of the law regarding wages and the settlement of disputes, and a description of the organisation and activities of employers' associations and trade unions. All these subjects have been dealt with in this book, usefully by all contributors, brilliantly by Professor Kahn Freund, in a chapter entitled " Legal Framework ". But no writer on this subject at the present time can leave it at that. And no wonder —if this is all there is to it, it is not merely Hamlet without the Prince, but without Ophelia and Polonius into the bargain. No one is content to write about such a valley of dead bones. We all know now that it is not from these facts that we shall discover what it is that makes men at work tick, go slow, stop and start again—the questions to which we really want the answers. The editors are aware of this and attempt to forestall criticism in the preface by stating that they have deliberately excluded from this book any contribution from those who apply "the technique of sociology and social psychology direct to situations, in factories or other places of work". But despite this defence they can fairly be criticised for letting in at the back door the very subjects they have excluded from the front. Implicit in Mr. Flanders' chapter on "Collective Bargaining" and in Mr. Clegg's and Mr. Chester's on "Joint Consultation" are questions of political theory, of psychology and of sociology. This is not the fault of the authors. It is inevitable: for these elements are inherent in the problems they discuss. It is because so many different approaches and disciplines are involved in the attempt to dig deeper into these matters that the study is so baffling, so elusive and so fascinating. It is also the reason why the book we really need is likely to remain unwritten for a very long time.

NANCY SEEAR.

Population. By IAN BOWEN. Cambridge Economic Handbooks. James Nisbet & Co. Ltd. and Cambridge University Press. 1954. xv + 256 pp. 10s. 6d.

Professor Bowen's book in the Cambridge Economic Handbooks series is a general survey of population as related to economic growth. It is divided into three sections, entitled "Introductory Survey", "Analysis" and "Future Prospects". The first and last sections have separate chapters on Britain and the rest of the world.

There is a great opportunity for such a book. The accepted views of population prospects have been undergoing rapid change—for the Western countries because of the "baby boom", for the under-developed world because of striking reductions in death rates. Owing to the enormous expansion in statistics in the last few years, a factual skeleton can now be provided for much that, only a short while ago, had to remain unsupported conjecture. Some of the problems of natural resources have been revolutionised by new technology, particularly in the field of energy. Both theoretical discussion and practical experience are rapidly accumulating regarding the economic development of under-developed countries. Finally, the post-war world provides a strikingly changed background to economic and political arguments about the advantages of population growth in Britain or abroad. For all these reasons, even a very good book of only a few years ago would by now be out of date. There has, in fact, been no post-war book on population problems in general which could be recommended for the use of students.

The subject is so extensive that one might expect a textbook to be confined to the barest essentials. Professor Bowen devotes one quarter of his book to the views of Malthus and his contemporaries and to theories of static equilibrium. A detailed knowledge of just what Malthus said at various times, though important for the study of the history of economic thought, is not very useful equipment for understanding population problems. Moreover, this aspect is covered in several recent books. Professor Bowen has also given space to some relatively recondite topics, e.g. the logistic curve or the genetic aspects of intelligence. Nevertheless, almost everything one expects to see in such a work is touched upon, if sometimes in odd places (e.g. the spread of birth control comes in a chapter called "Equilibrium and Working Population"). The trouble is rather with the manner of treatment. Much of the book reads like a report of conversations. The arguments of opponents, real or imaginary, are constantly being refuted. There is much play with definitions and distinctions which are not pursued. The topics occasionally have a debating society ring (e.g. " is *the* cause of poverty to be found in ' bad institutions ' or excessive population growth ? ").

There is no proper presentation of either demographic facts, the resource situation or economic development problems. The reader is told that India and some other countries have a serious problem arising from population growth, but just how big this problem might be, or what, if anything, might be done about it, is not discussed. The basic lack is that no systematic effort is made to display the quantitative knowledge that exists and just how far this knowledge carries us. The effect is as if one were looking at the subject in one of the distorting mirrors occasionally seen at fun fairs. All the features are there, but they have been jumbled up ; the prominent ones have been shrunk and the inconspicuous magnified.

Much of this book is enjoyable to read. Many important points are neatly made ; there is a pleasant atmosphere of common sense. But in a subject on which there is a great deal of complex factual information, common sense, even combined with a gift for lucid presentation and logical niceties, is not enough.

J. HAJNAL.

India and Pakistan : A General and Regional Geography. By O. H. K. SPATE. With a chapter on Ceylon by B. H. Farmer. Methuen & Co. Ltd. 1954. xxxvi + 827 pp. 65s.

Although I am not a geographer I have no hesitation in saying that this is a grand book—erudite, perspicacious, epigrammatic. It is not necessary to be a geographer to enjoy it, and indeed the nearest that Professor Spate gets to a definition of " Geography " is in note 14, p. 242, where he says it is unnecessary to discuss the varieties of land tenure, and whether Land Revenue is rent or tax, as all this " isn't geography ". On the other hand, it is not a book for the lazy reader, nor is it one of which more than a very privileged few can say that once opened they read on to the last page without stopping. It is, indeed, a work to dig in rather than to hoe: it is extremely concisely (perhaps too concisely) written, whilst, before starting, the reader must master a set of abbreviations and conventions, some of which are peculiar to the author. For Professor Spate has an original mind, which shows itself in the form as much as in the contents of the volume. But for this preparatory work the reader will be amply rewarded by a full, detailed and scholarly analysis of the four main " topics ": Part I, " The Land ", i.e. a general account of the structure and relief, climate, vegetation and soils of the Indian Peninsula; Part II, " The People ", i.e. a discussion of the demographic structure and problems, the ethnic stocks, historical demographic developments (since earliest times), and the characteristics of villages and towns; Part III, " The Economy ", i.e. an analysis of agrarian, industrial, transport and trade conditions and problems; and Part IV, " The Face of the Land ", i.e. a more detailed geographical regional study.

To the non-geographer, at least, the fascination of this book lies, perhaps, most of all in the speculations, or sudden illumination aroused by a phrase, a stimulating aside, or a caustic comment. For almost every page includes a " Spatism "—witty, aphoristic or devastatingly destructive of widely held preconceptions, as the case may be. In Part III, " The Economy ", which (together with Part II) appealed to me most, what I admire above all, is Professor Spate's power of summing up, in a sentence or short paragraph, the essence of some situation or problem about which whole volumes have been written that carry less conviction.

Obviously, a work of this wide scope and ambitious nature is open to criticism. Let the geographers make the geographical criticisms. I will confine myself to giving a few examples of the type of shortcoming or lack of precision which seem to me likely to arise from excessive conciseness. For instance, on page 224 the author suggests that American varieties of cotton result in higher output per acre. But surely this is not so, other things being equal. What accounts for the higher output per acre in the North-Western areas is the more extensive use of irrigation, and slightly more explanation would have made this clear. On page 244 his reference to the " long-agitated question of Agricultural Income Taxation " gives the false impression that such taxation has not yet been adopted, whilst it is not clear what is meant by the remark on the same page that the " main fiscal resource of India lies in the land ". On page 233 it is going a little far to attribute the neglect of fishing to " almost a masochistic tendency to make the worst of a bad world ", although one would greatly like to know what is the real explanation.

It would be helpful to have a closer correlation between the map showing " Irrigation, Old and New " on page 205, on the one hand, and Table XIV giving the " Major Development Projects ", on the other hand (although one would not expect all the development projects to be shown on the map).

Moreover, item 5, " Thal 6–10 " on the legend to the map is confusing, whilst the weaker brethren (like myself) would have welcomed more explicit references for " ahars, karez, and kuls " than the somewhat hard-hearted " see relevant regional chapters ". But these are small blemishes on a rich and varied background.

VERA ANSTEY.

General Union. By H. A. CLEGG. Blackwell. 1954. 358 pp. 27s. 6d.

The growth of the general unions is perhaps the most remarkable development in the history of labour organisation. These massive unions, embracing workers from scores of industries and hundreds of different establishments, defy the basic principle of trade union organisation—association on the basis of the common interest of similar types of workers. The gas worker has little in common with the employees of a food processing factory, or a London bus driver, or a flour miller, yet the general unions have so successfully overcome the difficulties of organising all and sundry that almost one quarter of all trade unionists are in three such unions.

Mr. Clegg's study of the National Union of General and Municipal Workers describes the growth of the second largest union in Britain, the working of its government and administration, the role which it has played in six of the many industries and services in which its members are employed, and its relations with the wider labour movement.

The book inevitably invites comparison with the study of the Transport and General Workers' Union made by Dr. Goldstein. In method, the two investigations are poles apart; whereas Goldstein relied on the statistical records of voting and membership participation in union activities to evaluate the strength of democracy, Clegg has used a more subjective means—his intimate knowledge of the working of the union—for the purpose of his analysis. Another substantial difference between the two books is that whilst Goldstein paid no attention to the way in which the Transport and General Workers' Union had discharged its bargaining functions, Clegg has set his study of the N.U.G.M.W. in the context of the union's work in industry. The upshot of the comparison is that Clegg's book, though it has not had the sensational reception accorded to Goldstein's volume, is a far more cool and mature study and a much better guide to the character of a large British trade union. It is, perhaps, the best study of a single union that has ever been made in this country.

B. C. ROBERTS.

Leaders of British Industry. By G. H. COPEMAN. Gee & Company (Publishers) Ltd. 1955. 173 pp. 15s.

This book is a study of the origins and careers of the directors of large British companies. The raw material for the work was derived from standard questionnaires addressed to 3,200 directors of companies with net assets of £1,000,000 or more. The questions asked embraced the family background, education and professional career antecedent to Board appointment. The answers to these questions were punch-carded and classified in various ways.

The presentation is scholarly, meticulous and highly readable. The author is fully alive to the hazards of over-deduction, and he steers a middle course between ingenuous conclusion and excessive qualification. The conclusions are interesting and significant. It is, for example, quite contrary to expectation to find that so many men have reached the boardroom by their fortieth birthday. It is less surprising but more sobering to see that the men who change employment several times in their youth are thereby much less likely to arrive in the boardroom, which strongly suggests a growing institutionalism of British industry.

With the unique compilation of data at his command, the author might well have ventured a little speculation upon the social and psychological variables which his statistics reflect. It is, for example, worth more than a passing comment that a mere 4 per cent. of directors started their career in " skilled trade ", compared with 14 per cent. in a clerical post. It was clearly better to have ink than oil on the fingers 30 years ago. It would be interesting to know if that situation has changed.

In listing the " original occupations " with which the directors were asked to identify themselves, it seems to have been a mistake to include the category " Trainee for Executive Post " along with lawyer, accountant, skilled tradesman, and so on. There is an element of circularity in the conclusions which the author draws from the fact that this was the commonest original occupation to be returned. Naturally, if a man is a director today, he probably was ambitious in his youth, and in his own mind was training for an executive post from the outset. The analysis suggests that about 60 per cent. of all directors had fathers who were in business and 20 per cent. whose fathers were directors of the same firm. It would be fascinating to know more of the mechanics of nepotism in industry than this statistical peep can disclose.

The author, perhaps prudently, makes no effort at assessing the personal qualities of the class of men which he studies but he has missed an opportunity in not isolating the statistics pertaining to managing directors from the remainder. After all, there are reasons for promotion to the board other than the " outstanding ability or knowledge " which Dr. Copeman presumes to be the test. The process of " kicking upstairs " is not unknown, but it is a fair assumption that managing directors are more likely to have special qualities which would make them a well defined and exceptionally interesting statistical group. But such comments are not criticism, and it would be ungenerous to over-emphasise them.

The book should be read by everyone concerned with the leadership of industry, and Dr. Copeman is to be congratulated on the initiative and skill displayed in this study and on the modesty and clarity of his conclusions.

H. P. Barker.

Economic Activity Analysis. Edited by Oskar Morgenstern. Chapman & Hall. 1954. xviii + 544 pp. 54s.

This volume contains thirteen papers by a number of different authors, all of whom were engaged on a Princeton University research project called " The Mathematical Structure of American Type Economies ". They are mainly concerned with various aspects of input-output analysis and, as would be expected, are largely mathematical. Indeed one section of the book, containing seven of the papers, is called " Mathematical Properties of Linear Economic Systems ".

Part I consists of four papers which are of mainly economic content although the treatment is of a mathematical nature and in several cases requires at least a general knowledge of matrix algebra. The first of these papers, on " Models of General Economic Equilibrium " by J. Balderston, is a historical account of such models. A good deal of attention is given to the general Walrasian system and its consolidation and modification by Leontief; a description is also given of Von Neumann's model of an expanding economy and the United States Air Force dynamic generalisation of the earlier Leontief model. A much more detailed general account of the input-output system and its developments is given in a paper by O. Eckstein, while problems of aggregation, which arise even in very detailed input-output models, are discussed by J. B. Balderston and T. M. Whitin. The last paper in this section deals with further specific problems which arise in the use of an input-output system, namely the treatment of imports, distributive margins and transportation charges.

Part II is concerned with mathematical properties of linear systems. These are of obvious importance for the proper application of input-output analysis but the papers themselves will be of most interest to mathematicians. The less mathematical economist will, however, be grateful for the inclusion of one by Whitin which provides an economic application of the purely mathematical paper which precedes it.

Part III is called " Meta-Economics " and contains two papers. The first by Karl Menger was originally published in 1934, and is concerned with the logical exposition and derivation of the law of diminishing returns. The second paper in this section, by Morgenstern himself, is entitled " Experiment and Large Scale Computation in Economics " and is of quite another kind. It is concerned primarily with a discussion of possible developments in economic analysis which result from modern methods of computation and possibilities of controlled experiment. Analogue computers and so-called electronic brains make possible many kinds of computation which were formerly ruled out and enable the applied economist to study theoretical systems of much greater complexity than was previously possible. Morgenstern suggests that they also provide the possibility of making purely numerical computations (e.g., mathematical analysis of time series or correlation calculations), not based on existing *economic* theory, which may be regarded as new data from which such theory may be deduced. He likens this to the "just looking" which occurred in the natural sciences with the invention of the microscope and telescope, and which led to important theoretical developments. It may be that the electronic computer is indeed a device which can be used in such a way, but this hardly seems likely to yield much of value until we have given far more attention to another of Morgenstern's special concerns—improvement of the accuracy of economic observations.

J. E. G. UTTING.

Money and Banking in British Colonial Africa. By W. T. NEWLYN and D. C. ROWAN. Oxford University Press. 1954. xiv + 301 pp. 30s.

The British people for many years have been woefully ignorant of all but the most elementary facts about the many diverse territories which in varying degrees come under the political and economic control of the Colonial Office. Economists, although their consciences may have been vaguely troubled by the adequacy of the rewards offered to the Colonies for their contributions to the Sterling Area's dollar pool, have not proved to be exceptions to the rule. This book, which gives an account of the monetary and financial systems of the eight major territories in British Colonial Africa, would be welcome if it did no more than shed light on some hitherto dark corners. However, it is doubly welcome because the authors, in pursuing their additional objectives of analysis and prescription, have succeeded in presenting an admirable study in comparative banking.

In their primary task of describing the complex monetary and banking systems of the eight territories they succeed by lucid and logical accounts in illustrating the nature of the common factor of economic dependence on the United Kingdom despite the differences in their economic and political organisations and the extent of their reliance upon expatriate enterprises. All are *monetarily* dependent on the United Kingdom in that "their domestic currencies are defined in terms of sterling and kept stable in terms of sterling by the operations of the currency board system"; they are *financially* dependent in that "their banking and financial systems are part of the banking and financial system of the United Kingdom". The structure and working of the credit institutions, which include not only the banks, both extra-territorial and indigenous, but also the co-operative societies, land banks, moneylenders and expatriate enterprises such as the United Africa Company, are described and criticised against this background of economic dependence.

In evaluating the extent to which these institutions meet the *present* needs of the territories the authors state the basic problem clearly and cogently. The Africans feel that too frequently their legitimate demands for credit are refused by the banks so that they are forced into reliance upon the extortionate money-lenders. The few statistics available show clearly that bank advances to Africans are both relatively and absolutely small in relation to the sums lent to foreign traders such as Indians and Levantines. But the expatriate banks are not just being hypocritical when they justify their apparent discrimination on the grounds of the inadequate credit-worthiness of the average African who usually cannot offer suitable collateral securities and employs only rudimentary methods of book-keeping. However, the authors are surely correct when they conclude that this gulf has been caused partly by the "export" of British canons of commercial banking without any adaption to local conditions. The British country-banker of an earlier period made his contribution to economic development by judging credit-worthiness according to his personal knowledge of the borrower. Although the expatriate banks are too remote from the average African to adopt such a policy, the authors believe that the indigenous banks should be encouraged to do so. The corollary to this, that the expatriate banks should support the indigenous banks in this task by the development of "mixed banking" such as in the nineteenth century aided German economic development, seems eminently reasonable. Thus an integrated system may eventually emerge.

The most controversial part of the book deals with the question of central banking. It is usually argued that there is no scope for a central bank in dependent economies because the movement of credit will be determined by external conditions. Against this it may be said that a central bank may help the various adjustments to occur more smoothly. But the authors justify their case for a central bank on the unusual grounds that it would assist economic development by encouraging and guiding the "development of the indigenous banking system and growth in the financial mechanism". In this controversial issue they eschew a doctrinaire approach and using their "development criterion" advocate the establishment of a central bank only in Nigeria and the Central African Federation.

In all, this book is not only a highly competent presentation of a complex subject and a nice blend of theory and description, it is also a pleasure to read.

G. Clayton.

Monopoly and Competition in Banking. By D. A. Alhadeff. University of California Press. Cambridge University Press. 1954. ix + 254 pp. 34s.

"Probably no sector of the economy", Mr. Alhadeff writes in his Preface, "is more heavily and exhaustively documented statistically than is banking". This in itself is sufficient to indicate that it is with the United States alone that his book is concerned. Not that this leaves him too narrow a range—on the contrary, the variety of banking organisation within the United States gives the author plenty of scope. Despite the intentions of legislators—in part because of them—the United States is the great home of banking monopolies, besides including important areas where competition is quite sharp. The official documentation—unique in its detail—is examined in this book in an attempt to throw some light on the effects of varying degrees of monopoly in banking.

The author's theoretical approach is that of a student of Chamberlin and Triffin, and it is a fruitful one. The conclusions are not easy to summarise. Perhaps the most important is that the small-town customer, who often has virtually no choice in finding a banker, pays heavily for the privilege of excluding branches of widespread banking organisations. International comparison would tend to the same impression. There are no such comparisons in this book; perhaps this is because Mr. Alhadeff could not have found comparable material elsewhere—but he is usually at his best when he is using other material as well as the published figures, and some consideration of other countries, bare as they are of statistics, might have yielded illuminating results. The peculiar shading of monopoly and competition which we have in English banking, for example, results in a quite different structure of bank charges: there is more standardisation of charges in England, to the advantage of the small-town customer whose American counterpart suffers from high charges.

Given the present lively interest in the monopoly issues in American banking, this will probably not be the last book of its kind. But it is, I believe, the first, and it is a notable contribution to banking literature.

R. S. SAYERS.

Immigration and the Foreign Born. By SIMON KUZNETS and ERNEST RUBIN. National Bureau of Economic Research Inc. Occasional Paper No. 46. New York. 1954. xii + 107 pp. $1·50.

This monograph reflects a revival of interest in the course of immigration into the United States since the early 19th century; but the questions now being asked are different from those which inspired the previous analysis sponsored by the National Bureau of Economic Research—Harry Jerome's *Migration and Business Cycles* (1926). Prominence is now given to the " long swings " in immigration, each swing lasting about twenty years. Similar fluctuations are found in gross national product per worker and housing construction; the immigration swings *follow* the former and *precede* the latter. Immigration contributed as much as one fifth of the growth of the American labour force between 1870 and 1910. Fluctuations in additions to native born population of foreign parentage were found to be different in timing from those in additions to native born of native parentage or to foreign born; there was a lag of about ten years in the effect of additions to foreign born on additions to native born of foreign parentage, and this had a damping influence on the long swings in the growth of population during the period when immigration was an important factor. The results are based on a careful scrutiny of the sources on immigration and emigration, and a reconciliation of these data with the census information on resident foreign born; Part III of the book gives an admirable account of the methods used.

Independent investigations have firmly established the main facts about the long swings in migration, building and national product per head. This book emphasises that . . . " the mechanism of these long swings is complex and that their further exploration promises to shed light on the past behaviour of this country's economy—and perhaps also of other economies " (p. 34). The authors draw attention to a number of fascinating questions which would amply repay intensive analysis.

BRINLEY THOMAS.

Medieval Merchant Venturers: *Collected Studies*. By E. M. CARUS-WILSON. Methuen. 1954. xxxii + 314 pp. 30s.

This volume of Professor Carus-Wilson's collected papers includes most of her publications concerned with medieval English economic history. But a useful recent article on trade in woad has been omitted to the regret of at least one reader (*Revue du Nord*, xxxv, 1953). The papers republished here form a major contribution to the history of the English textile industry and of the trade in English cloth in the middle ages. Until the appearance in 1941 and 1944 of Professor Carus-Wilson's articles there was a serious gap in our knowledge of the transition from the urban textile industry of the twelfth and earlier thirteenth century to the predominantly rural industry of the late middle ages. She was the first to show that the spread of the fulling mill in the English countryside in the thirteenth century proved one of the decisive factors in this change, though she also carefully analysed the weaknesses in the organisation of textile production in towns that made the urban industries particularly vulnerable to rural competition. There are no strictly contemporary parallels to this development on the Continent, which makes the English story all the more instructive. The emergence in the second half of the reign of Edward III of a prosperous export trade in English woollen cloth can now be satisfactorily related to the earlier development of the new rural centres of textile work. The author's account (1950) of the growth of this export trade and of the resulting decline in the export of raw wool partly supersedes the work of H. L. Gray. It is based on the examination of the whole series of customs' accounts for the crucial period 1347–1399 (while Gray only used samples), and by revealing fluctuations in development of the export trade it makes the whole story more intelligible. An earlier article (1933) cleared up the mystery of the origins of the company of the Merchant Adventurers exporting cloth to the Netherlands. The author was the first to use their fifteenth century records, found among the muniments of the London Mercers. She demonstrated quite conclusively that a group of London mercers interested in trade to the Netherlands formed the core of the London fellowship of the Adventurers and she was able to reconstruct the early organisation of the company. One of the main themes of English economic history in the later middle ages is the rise of the English merchants to the position of great importance and ultimately of predominance in the foreign trade of this country. In tracing the rise of the Merchant Adventurers Professor Carus-Wilson tells one part of this story. Her detailed study of the trade of Bristol in the fifteenth century (1933) makes another valuable contribution here, for Bristol's trade was always dominated by English merchants.

Other studies in this volume include an article on English trade with Iceland and a brief survey of the trade between England and Gascony from the reign of King John to the loss of the English possessions in France in 1453. A general introduction has been added by Professor Carus-Wilson, summing up for non-specialist readers the salient features in the history of English trade in the fourteenth and fifteenth centuries. It includes a very useful graph of exports of wool and cloth (the latter split up into exports by Englishmen and foreigners) from 1347 to 1544. The graph is mostly based on figures already published, but various adjustments have been made. The figures for cloth and wool between 1377 and 1399 and for wool alone between 1483 and 1509 are new.

E. B. Fryde.

Industrial Peace and Labour in India. By K. N. Srivastava. Kitab Mahal, Allahabad and Bombay. 1954. xi + 499 pp. R. 7–8.

This book traces the history and development of trade unions, working conditions and labour relations in India. It cites by way of example—and usually, in the author's view, to the disadvantage of India—legislation and practice in other countries ranging from the U.S.A. to the U.S.S.R. The attitude of Indian employers, in the author's contention, is that " for increasing their own wealth, they want to cut the stomach of others and throw the country in wilderness ". " It is not merely for joy ", he contends, that workers go on strike and face the hazards which apparently accompany strike action in India. On these occasions it appears that " generally the workers demonstrate a peaceful and quiet protest against the onslaughts of the employers ", while they run the risk of " losing their job and they and their families may have to starve, may have no house to live in, and may even be beaten, imprisoned or shot dead ". If all this is true, there is no room for surprise that, as the author says in another connection, referring to living conditions, " Life for such workers is curse ". In any event, it leads him to the conclusion—which, indeed, is the central theme of the book—that " if peace in industry is wanted, private capitalism must go ".

Be this as it may, there are two points of more immediate interest for the student of industrial relations which arise from Indian experience. The first is the division of the trade union movement, and its consequent industrial ineffectiveness, when it becomes a mere adjunct of political parties. The second is the dilemma which faces a country without effective collective bargaining which wishes to encourage it. It must provide some machinery, such as compulsory arbitration, to deal with cases of failure to bargain or to agree. The State machinery so provided to supplement the deficiencies of collective bargaining may well supplant it.

H. S. KIRKALDY.

West Highland Survey. Edited by F. FRASER DARLING. Oxford University Press. 1955. xvi + 438 pp. 30s.

In 1944, Dr. Fraser Darling received the financial backing of the Development Commission for a full-time investigation of the social and economic problems of the Scottish Highlands. This report is the main, though not the only, product of the investigation. It is an authoritative attempt to discover the nature and causes of the ' Highland problem ' from a detailed survey of crofting ' townships '. The wealth of information on individual townships and parishes is probably the report's most important new contribution, since many of the survey's findings have already been published elsewhere. There is little doubt that the book will become an indispensable source of knowledge for all concerned with the future of the Highlands.

The survey reinforces two points of view which are steadily gaining support. Firstly, it debunks the idea that introduction of new industry will solve the Highland problem. Any lasting solution must be based on soil and sea. Secondly, it shows that, to be effective, any effort to rehabilitate the West Highlands must be made through a single authority with wide powers (the Crofters (Scotland) Act of May, 1955, has in fact put considerable power into the hands of the new Crofters Commission), and not in the piecemeal fashion which has been the practice hitherto. Unfortunately, on economic matters, where such an authority would need considerable help, the report is weak. It appears implicitly to assume that, since the case for rehabilitation is not primarily economic, there is no need to count the cost.

Mapping is inadequate and rather slipshod. There is no detailed map of the area, and the one small general map, which shows communications with the rest of Scotland, manages to give the height and location of Criffell, a small mountain on the Solway Firth, but does not name the important railway junctions of Perth and Inverness.

H. C. MACKENZIE.

Measurement of Productivity in Indian Industry. By R. BALAKRISHNA. Madras University. 1953. vii + 288 pp. R. 15.

This book presents the results of the author's researches at Madras University into the productivity of labour in Indian industry. The main effort is to construct indices of output per worker which will be statistically sensible. The data refer to the decade 1938–48. Labour productivity indices are constructed for Indian industry as a whole, for Indian industry in each of the three regions of Bombay, West Bengal, and the Rest of India, and for each of twelve manufacturing industries. The author calculates that between 1938 and 1948 output per worker in Indian industry as a whole fell by a little more (on one index much more) than 10 per cent. The explanations suggested are lack of replacement of equipment; irregular supplies of raw cotton, coal, chemicals and other raw materials; interruptions in power supply and transport difficulties; absence of rationalisation and of improvement in management. The factor of labour morale and efficiency is mentioned somewhat non-committally.

In the parts of the work dealing in more detail with individual industries the author attempts to take into account the influence of capital upon labour productivity. He seems aware that few useful conclusions can be drawn from figures of average output per worker, without somehow taking into account variations in quantity and type of capital. The estimation of " labour productivity " in a sense that would allow for such variations has floored researchers working with far more complex tools than the simple ones employed by Mr. Balakrishna. It is not surprising that he finds that no very definite conclusions can be drawn from the variations, as between industries, in his indices of output per unit labour.

H. MAKOWER.

England and the Salt Trade in the Later Middle Ages. By A. R. BRIDBURY. Clarendon Press. 1955. xviii + 198 pp. 21s.

Mr. Bridbury has written a very useful account of the organisation and character of the English salt trade in the fourteenth and fifteenth centuries in its international setting. He shows how English " white salt " after the middle of the fourteenth century ceased to be exported in any significant quantity, and even for domestic use it had to compete with coarse salt from western France, Spain and Portugal. This change, moreover, was part of a much larger transformation of the salt trade in north-western Europe. Studies of the salt industries of Lüneburg and the Low Countries show that indigenous supplies of salt for the Baltic countries, Germany and the Netherlands also began to be replaced at this time by salt from further south and particularly by " Bay salt " from Bourgneuf. There is a good account of the development of the salt industry in that region, of the Dutch and Hanseatic trade in " Bay salt " and of the effects of that trade upon the salt industries in the Low Countries and at Lüneburg. Based as his study is upon original sources, Mr. Bridbury sheds new light upon a little known but not unimportant branch of medieval commerce. It is perhaps another matter to describe his subject as a " commercial revolution ": the word revolution is coming to be so overworked in economic history that it is in danger of being used as a synonym for mere change. There are also occasions when Mr. Bridbury's excursions into the more general fields of late medieval history display less sureness of touch than his dealings with the salt trade. His hypothesis that the cloth industry attracted labour from the salt industry is advanced more positively than the lack of evidence seems to warrant. His remarks on late medieval population trends, again, are hardly convincing as they stand, and in particular neglect Mr. J. Saltmarsh's findings on the effect of *successive* plagues on population. This may merely indicate, however, that much work remains to be done before the general framework of the late medieval economy becomes clear to us; in the meantime Mr. Bridbury has given new clarity to the segment of it he has made his own.

EDWARD MILLER.

The Value Judgement. By W. D. LAMONT. Edinburgh University Press. 1955. xv + 335 pp. 25s.

This book, by a philosopher, is in part economic theory and in part philosophy. Part I, which is concerned with valuation as understood by the economist, is, in the main, economic theory, and, in spite of much penetrating analysis and in spite of its disciplinary value for economists who are sometimes careless in formulating their fundamental assumptions with logical nicety, it is disappointing. Part II, entitled " The Attribution of Goodness ", is pure philosophy, but is not on that account less deserving of careful perusal by the economist. It contains an admirably lucid account of the rival theories on this topic and a most convincing statement of the case for a mainly conative theory of " approval ". No doubt economists, *qua* economists, should be neutral on the issues raised in this part of the book but they can hardly fail to be profoundly interested in Dr. Lamont's analysis.

It is surprising, in view of Dr. Lamont's clearly demonstrated skill as a philosopher, that he has not tackled the problem he sets himself in Part I in a way which would be more satisfying to economists since it is they whom he is addressing. In spite of profound disagreements between " behaviourists " and " utilitarians ", between cardinal and ordinal " utilitarians ", disagreements of which Dr. Lamont seems quite unaware, economists do not disagree over what they mean by valuation, nor of how choices are made as a result of such valuations. If, for example, an individual is consuming x, y, . . . of commodities A, B, . . . his evaluation of X in terms of A (or B, . .) means simply the marginal rate of substitution of X for A (or B, . .), which keeps him indifferent to the substitution. But this is not what Dr. Lamont means by valuation. His second fundamental proposition asserts " Value is attributed to the non-existent, never to the existent ", a proposition that is true only if we assume that valuation never arises except when a choice has to be made between alternatives, none of which, needless to say, exist until after the choice has been made. Surely it cannot be denied that I can value my stock of sugar at 2d. per lb., whether or not the opportunity exists of buying or selling at 2d. per lb. or at any other price ? But whether or not I can evaluate without making a choice, fundamental to the economist's theory of value is the concept of a marginal rate of substitution which is in any case operative as soon as opportunities arise. The whole body of modern economic theory rests on the notion of valuation, whether actual or potential, in this marginal sense, and on the existence of a law of diminishing valuation as the item valued increases quantitatively, other items held constant.

It may well be that the series of propositions developed by Dr. Lamont are formally correct, but they do not seem to be the kind of propositions required by the economist. If they justify the assumptions made by the economist, well and good, but if they do not, this should be made clear and the economist be asked drastically to revise his fundamental theory. There does seem to be a suggestion of the necessity for such revision, judging from Dr. Lamont's discussion of the utility concept. Yet Wicksteed's views on marginal utility and its diminution seem to me above reproach, despite Dr. Lamont's severe strictures.

It has, of course, to be admitted that the wranglings of economists about the utility concept obscure the fact that there is a body of value theory that is well defined and generally acceptable and that this theoretical structure has emerged only after much confusion in the early stages of its development. This body of theory can gain little from philosophical analysis and can be properly grasped only after some considerable training in economic theory. Nevertheless, economists are still floundering in their attempts to secure a sound philosophical and psychological basis for this body of theory, and it is hoped that philosophers in general and Dr. Lamont in particular will continue to intervene and help to clarify the real issues involved.

W. E. Armstrong.

Colonial Development and Population in Taiwan. By George W. Barclay. Princeton University Press. London: Geoffrey Cumberlege. 1954. xviii + 274 pp. $5. £2.

A Report on Taiwan's Population to the Joint Commission on Rural Reconstruction. By George W. Barclay. Princeton University Press. London: Geoffrey Cumberlege. 1954. xiii + 120 pp. $2·50.

Taiwan is one of the few areas inhabited by Chinese for which adequate census records are available during the first half of the 20th century. The Japanese, after occupying the island, needed accurate population statistics in order to exploit its resources fully and to control its population adequately. Censuses were therefore taken regularly and adequate household registers were kept. Dr. Barclay is the first Westerner to have studied these data and he has published his findings in the two books under review. The first deals with the period of Japanese occupation, the second reports on developments after the war, when the system of statistics that had been built up was allowed to deteriorate.

Dr. Barclay's results are not unexpected. He traces the change that took place after the Japanese began to take over and exploit the island's economy, shows how the towns grew and the occupational structure developed, and indicates how the Japanese, without the benefits of modern drugs, were able to control some of the epidemics by draconic enforcement of public health regulations.

Unfortunately, statistics in the post-war period were not kept with any degree of accuracy, and as Dr. Barclay points out it will become progressively more difficult to study current population trends unless the deterioration is halted. But it is clear that Taiwan remains a country in which there is a considerable amount of population pressure, and that it does not differ materially from other Asian areas in this respect.

These books are interesting as case studies of the effect of colonial developments on population movement, and Dr. Barclay has performed a valuable service in making these records accessible.

E. GREBENIK.

SHORTER NOTICES

The Dock Worker: An Analysis of Conditions of Employment in the Port of Manchester. By University of Liverpool Department of Social Science. Social Research Series. The University Press of Liverpool. 1954. 277 pp. 17s. 6d.

This careful survey of the labour problem in the Port of Manchester suggests that the National Dock Labour Scheme, which was designed to abolish the casual nature of employment on the docks, has succeeded in providing a minimum degree of economic security, but has failed to promote more stable and harmonious industrial relations. The principal reason for this failure has been the retention of the " call system " which makes the development of a sense of loyalty to the employer almost impossible, since in effect, it leaves employment still on a casual basis.

The scheme has led to the identification of the officials of the union with the port employers; as a result the authority of the union has been seriously weakened and doubt and distrust of the whole system of industrial relations in the docks have grown. This diagnosis is not accepted by all those directly concerned, but the Committee which is to enquire into the Dock Labour Scheme will be unable to overlook the evidence that has been marshalled in this timely study.

Elizabethan Copper: The History of the Company of Mines Royal 1568–1605. By M. B. DONALD. Pergamon Press Limited. 1955. 405 pp. 60s.

The Company of the Mines Royal was the first English company to be established for manufacture rather than for trade. It was formed on the initiative of German mining promoters, had a mixed Anglo-German directorate, and mainly concentrated its energies on exploiting the copper and silver resources of Cumberland.

With the aid of notebooks and diaries as well as of State Papers, this book examines the company's personnel, gives an account of the restatement of ancient mining law that the venture occasioned, describes the techniques used by the miners, goes into the company's finances, and ends with a survey of the Cornish enterprise on which the company embarked in 1584.

The Union and the Coal Industry. By MORTON S. BARATZ. Yale University Press London: Geoffrey Cumberlege. 1955. xvii + 170 pp. 30s.

The United Mine Workers under John L. Lewis are usually taken to provide an outstanding example of aggressive unionism with its own impact on the course of events in its industry. The interest of the present study is that it shows how much this interpretation needs qualification, when information about the development of the industry is brought together and surveyed.

It shows how difficult it is here to disentangle the effects properly due to the union, amid the welter of changes in technique and demand; and even in what were in one sense the unmistakable achievements of the union, it shows that the union was rowing with the stream: the rise in the relative earnings of the miners set in only with full employment from 1940; the expansiveness of the southern sector after the union got its wage-rates up to the northern level in 1941 suggests that the demand for labour was strengthening there in any case.

Statistics of National Product and Expenditure 1938, 1947 to 1952. By O.E.E.C. Paris. 1954. 310 pp. 14s.

This addition to the list of O.E.E.C. publications presents detailed data for the O.E.E.C. countries, the U.S.A. and Canada, including an attempt, fully explained, to secure common definitions, and hence comparability, of the data. However, as the authors point out, this comparability is limited, because of the use of official exchange rates in the conversion of national currencies into U.S. dollars. Another O.E.E.C. Report showed, for example, that this method greatly underestimates the real product of Western Europe compared to that of the U.S.A. For those requiring data on Western Europe, this volume is most helpful and convenient, even though the authors eschew any economic interpretation of their statistics.

Automatic Merchandising. By M. V. MARSHALL. Graduate School of Business Administration, Harvard University, Boston. Bailey Bros. & Swinfen Ltd. 1954. xi + 275 pp. $3.50.

Prima facie one would expect automatic selling to be an important, if still subsidiary, method of retail distribution in the U.S., for at least two reasons: (*a*) high labour costs; (*b*) the high frequency and volume of " impulse purchases " associated with a high *per capita* income. This study, after analysing the major " problem areas " and future possibilities of this method of selling, emerges with the conclusion that, although it is likely to expand further, it is unlikely to displace the other existing forms of retailing, because it is suited chiefly for the sale of certain convenience goods, of which cigarettes are the example *par excellence.*

The Cotton Industry—Today and Tomorrow. Edited by MARIO LUDWIG. The International Federation of Cotton and Allied Textile Industries. 1954. 288 pp.

This book was published by the International Federation after its Jubilee International Cotton Congress, held in Buxton in May, 1954. The papers delivered to the Congress are presented in the book along with the discussion stimulated by them. The first and longest paper, entitled " The Past, Present and Future of the Cotton Industry (1904–1954) " is a comprehensive survey by Dr. W. T. Kroese of the Netherlands, whose statistics and commentary will be useful to anyone interested in the development of the world textile industry. The other papers are both shorter and more specialised. They cover a very wide field, with sections concerned with the international monetary problems of the cotton industry (Professor Dupriez), the use of man-made fibres, a variety of technical developments in the industry, and sales promotion and market research.

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